

# ***Southern Power***

The Industrial and Power Journal of the

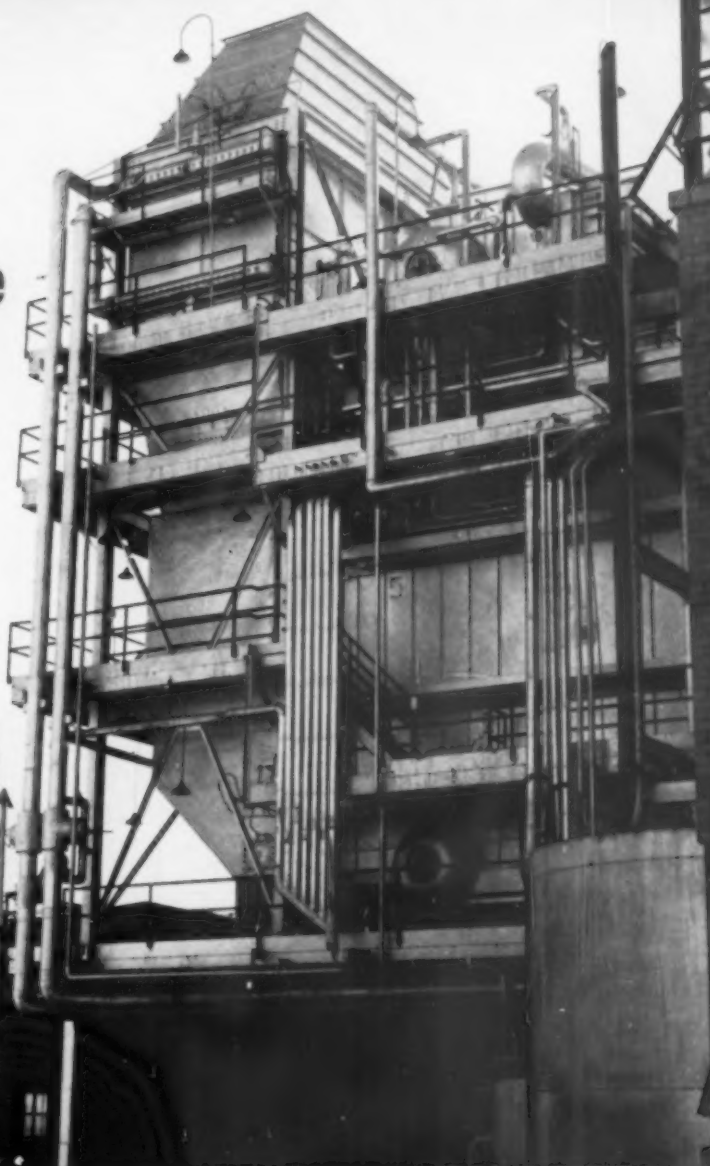
# ***Industry***

and Southwest

ER, 1960

University Microfilms  
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**Texas Plant  
Gas-Steam Cycle  
Report - - P. 32**



**Buyer's Guide on Thermal Insulation - - - P. 37**

# POWELL PRESSURE SEAL VALVES

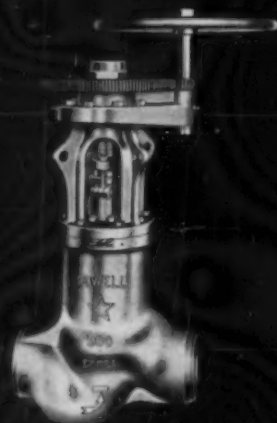


Fig. 19084—Steel Pressure Seal Non-Return Globe Valve for 900 pounds W.P. Spur Gear operated. Can also be furnished with bevel gears if required.



Fig. 11365—Steel Pressure Seal Horizontal Lift Check Valve for 1500 pounds W.P. Powell streamline design assures maximum flow through with minimum pressure drop and turbulence.

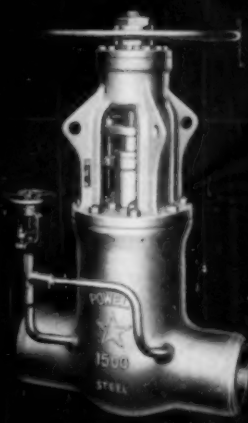


Fig. 11313—Steel Pressure Seal Gate Valve, with By-pass, for 1500 pounds W.P. By-pass valve is Powell Integral Bonnet Angle Valve, Fig. 1333A, for 1500 pounds pressure.

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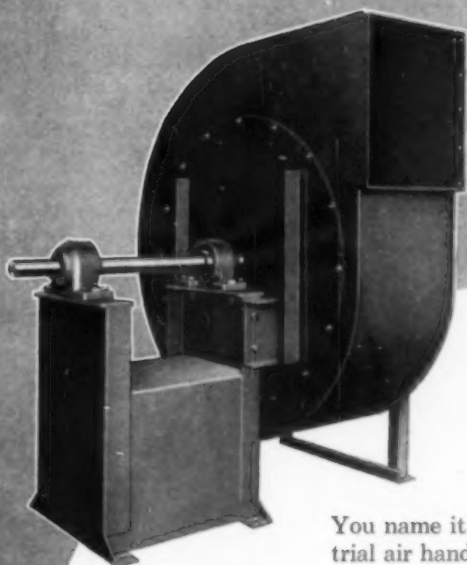
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Volume 78

Number 12

# How does industry rate CLARAGE?



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# Why a Steam Trap Has to Handle "Air"

Low temperatures and corrosion of equipment are often evidence of inadequate trap air venting capacity

Air, with its load of oxygen and carbon dioxide, has an unwholesome habit of interfering with the efficiency of steam heated units. If steam were always free of these undesirable companions, things would be a lot simpler for men-who-operate-plants. Because it isn't, three unhappy situations frequently occur:

**1. Operating temperatures are subnormal.** This is a two-part problem. First, an air-steam mixture has a lower temperature than pure steam at the same pressure—see Table A. Secondly, air can "plate out" on heat transfer surfaces as shown in Figure 1. Under some conditions, such an air film will knock down heat transfer efficiency by as much as 50%.

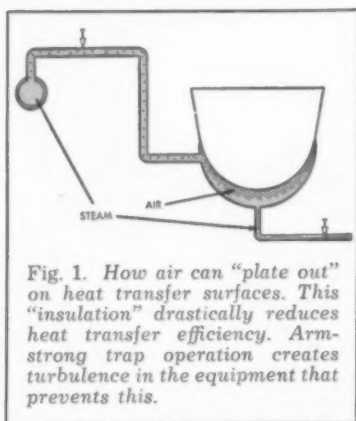


Fig. 1. How air can "plate out" on heat transfer surfaces. This "insulation" drastically reduces heat transfer efficiency. Armstrong trap operation creates turbulence in the equipment that prevents this.

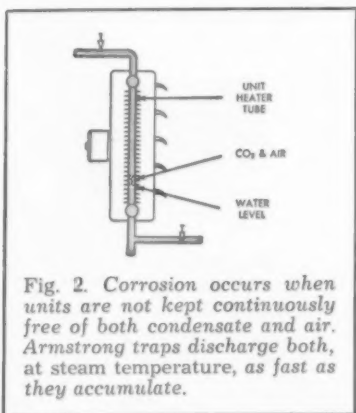


Fig. 2. Corrosion occurs when units are not kept continuously free of both condensate and air. Armstrong traps discharge both, at steam temperature, as fast as they accumulate.

**2. Corrosion rears its ugly head.** Oxygen and carbon dioxide are real trouble-makers. CO<sub>2</sub> gas goes into solution in condensate, forms carbonic acid and chews away at vulnerable metal sections. O<sub>2</sub> aggravates the situation. See Figure 2.

TABLE A—How air reduces steam temperature.

Gauge Pressure	Temp. of Steam with No Air Present	Temp. of Steam Mixed With Various Amounts of Air (% Air by Volume)	
		10%	30%
10.3	240.1	234.3	220.9
25.3	267.3	261.0	246.4
50.3	298.0	291.0	275.1
75.3	320.3	312.9	295.9
100.3	338.1	330.3	312.4

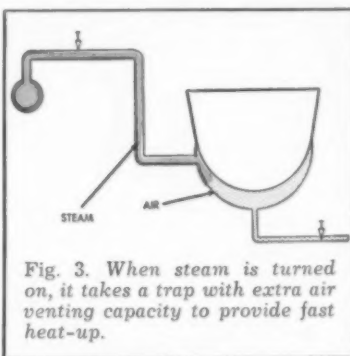


Fig. 3. When steam is turned on, it takes a trap with extra air venting capacity to provide fast heat-up.

**3. Heat-up is slow as a snail.** Air has a picnic in units that are shut off periodically. Figure 3 pictures the problem. Lines and equipment literally fill up with air. When the steam is turned on it can get in only as fast as the air gets out.

## Enter Steam Traps

Curing these steam system ailments involves an operation sometimes called a "trap transplant." It consists of removing traps that don't get the air out and replacing them with traps that do.

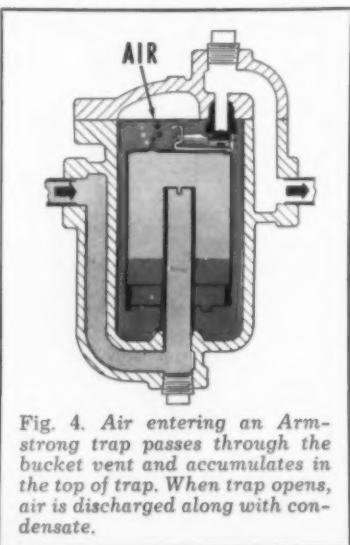


Fig. 4. Air entering an Armstrong trap passes through the bucket vent and accumulates in the top of trap. When trap opens, air is discharged along with condensate.

Figure 4 shows how an Armstrong inverted bucket trap continuously vents air. What the picture doesn't show is a built-in plus-value of this trap's design. An Armstrong trap opens suddenly, creating a momentary pressure drop and turbulence in the unit being drained. This breaks up air films and "pumps" air down to the trap so it can be vented.

The vents in standard Armstrong trap buckets will pass all the air normally encountered. In special cases, such as paper machine dryers, the vents are correctly sized larger at the factory to meet the requirement.

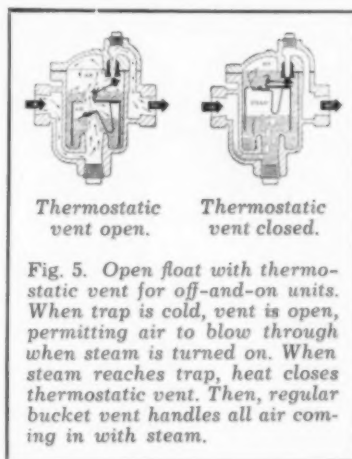


Fig. 5. Open float with thermostatic vent for off-and-on units. When trap is cold, vent is open, permitting air to blow through when steam is turned on. When steam reaches trap, heat closes thermostatic vent. Then, regular bucket vent handles all air coming in with steam.

## Open Float with Thermostatic Vent

Super air-venting capacity is a must for fast heat-up of low pressure unit heaters, heating coils, steam headers and other units that are on-and-off. Figure 5 shows how the Armstrong open-float-with-thermostatic-vent trap takes care of this.

\* \* \*

The 44-page Armstrong steam trap book covers other features of the Armstrong trap as well as its excellent air handling characteristics. This catalog also discusses trap selection, installation and maintenance. Your local Armstrong Representative or Distributor will be glad to give you a copy. Call him, or write Armstrong Machine Works, 2066 Maple Street, Three Rivers, Michigan.



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SOUTHERN POWER & INDUSTRY for DECEMBER, 1960



# Facts and Trends

December, 1960

- ◆ **STRONGER STEELS** — In a recent speech, W. R. Lightner of U. S. Steel said there are now more than 30 steels of the high-strength low-alloy type with yield strengths ranging from 45,000 to 50,000 psi. This compares with yield points of 25,000 to 30,000 psi of plain-carbon steels.

In addition to higher strength, these newer steels have good form-ability and weld-ability. They can be readily fabricated by the methods in use. In a box-frame member, a high-strength low-alloy steel with a 50,000 psi yield point was substituted for a carbon steel member having a yield point of 30,000 psi. Weight of the high-strength member was only 67 per cent of that of the carbon steel part. And when it comes to "T-1" constructional alloy steel with its 100,000 psi yield point, the weight is only 30 per cent.

- ◆ **FIBER GLASS** — From water heaters to interplanetary rocket nose cones, fiber glass is being used increasingly in a wider range of manufacturing.

Recently, the Saint-Gobain Company drew a wire only four microns in diameter but 20 miles long from a single gram of glass. This French firm's fiber glass process is now being used in Australia, Denmark, Great Britain, Italy, South Africa, Sweden, the United States, and other countries.

- ◆ **HEALTH INSURANCE** — The Chamber of Commerce of the United States urges business firms voluntarily to make group health insurance coverage available to all former employees who have retired and to present employees when they retire.

The National Chamber recently told employers, "the economic well-being of your retired worker should be of concern to you. And, as you know, nothing can destroy the morale of a retired person living on a fixed pension quicker than a serious illness that wipes out his savings and leaves him disgruntled and bitter in his old age."

- ◆ **ELECTRIC AUTOMOBILE** — Tampa Electric Company has announced the purchase of an electrically operated car, the Henney Kilowatt, as its participation with other electric utility firms in an experimental program.

The Henney Kilowatt is powered by heavy-duty batteries. It has 72 volts for power, plus 12 volts for lighting and control. The battery charging equipment, which is included in the car, operates from any convenient 110-volt outlet. Batteries can be fully recharged overnight. The driving range per battery charge averages 50 miles. The top speed will range between 32 and 35 miles per hour.

- ◆ **HOW LONG?** — The world has adopted a new international standard of length—a wave-length of light— replacing the meter bar which has served as the standard for over seventy years. The action

(Continued on Page 7)



## IN THE 100,000-GPM Bracket

When cold water requirements reach six-figure proportions, plant surveys suggest that selection of Marley Class 600 cooling towers is becoming a custom. The reason is "economic amplification" . . . as physical structure enlarges, so do Class 600's tangible and intangible advantages become progressively more important.

Consider the years that Class 600 structure adds to amortization period. Engineered for inherent durability, it has the added years-spanning protection of inert materials used at critical points throughout.

Class 600's longitudinally manifolded end-inlet distribution provides economy that increases with every foot of tower length.

Multiplied by the number of fan cells, the plus value of Marley engineered-for-the-job

mechanical equipment and vibration-free fans is most imposing.

Marley's development of specialized equipment to facilitate service operations assumes realistic proportions when days (rather than hours) are conserved.

Performance? It is generally accepted as an established fact that a Marley Class 600 Cross-Flow tower will meet or exceed specified performance. Results of consecutive tests published annually emphasize the validity of this conclusion.

These are only part of an impressive list of factors that qualify Class 600 towers for highest standing in the largest capacity field. And every one is prominently present in every Marley Cross-Flow, whether it be a one-, four- or forty-cell tower.

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**automatic boiler-burner plant**



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## **Facts and Trends (Continued)**

was taken by the 11th General Conference on Weights and Measures, recently meeting in Paris. The new definition of the meter is 1,650,763.73 wavelengths of the orange-red line of krypton 86.

While not of great concern to the man on the street, the new standard is of great importance to those engaged in precision measurement. For many years the world has relied on a material standard of length—the distance between two engraved lines on the International Meter Bar kept at Paris. There was doubt in the minds of some scientists regarding its stability. The new definition of the meter relates it to a constant of nature, the wavelength of a specified kind of light, which is believed to be immutable and can be reproduced with great accuracy in any well equipped laboratory.

- ◆ **STEEL** — Consistently high quality, availability and customer service, combined with product standardization and marketing practices which contribute to the stability and prosperity of pipe distributors, are the reasons American steel pipe producers expect their local distributors to handle American made rather than imported steel pipe.

This is the view of Henry J. Wallace, president of United States Steel's National Tube Division, who delivered an address before the annual meeting of the American Institute of Supply Associations, Inc., at Bal Harbour, Florida, recently. With American steel wage rates roughly four times as great as foreign rates, the American market is being supplied with certain types of foreign made pipe at prices which American producers cannot meet.

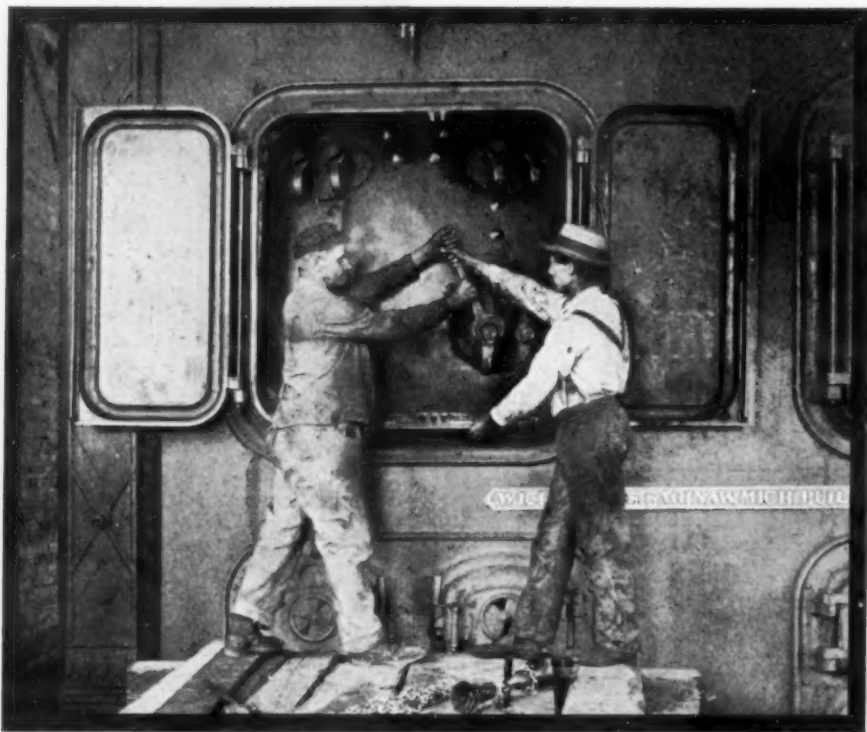
- ◆ **NUCLEAR FUEL** — Uranium carbide shows promise of becoming an important nuclear fuel material because of its high uranium atom density, good thermal conductivity and good irradiation stability, according to Herbert C. Kalish, chief of nuclear metallurgy at the Metallurgical Laboratories of Olin Mathieson Chemical Corporation.

One of the major problems with uranium carbide is the development of an economic method for fabricating the compound on a production basis that will result in the needed compositional control. Studying the techniques for producing solid uranium carbide bodies and comparing the properties of a powder-produced and a cast product are among the objectives of research being carried out at the Olin Mathieson laboratories under A. E. C. sponsorship.

- ◆ **COLORS METAL** — A new chemical surface treating process, which for the first time color coats all types of metals in a single treatment, is now ready for commercial application, Pennsalt Chemicals Corporation has announced. Called the Hinac Process, the new coating is produced in several grades, clear and colored, which are corrosion resistant, have good weathering properties and are color fast.

The Hinac Process, shown to the metal trades for the first time at the 1960 National Metals Exposition and Congress in Philadelphia, will be marketed nationally to all types of metal processors and fabricators. Hinac coatings can be applied readily to practically any metal, producing attractive satin and color finishes. In addition to being resistant to acids, alkalis and solvents, Hinac color coatings are considerably more economical than color anodizing or painting.

(Continued on Page 9)

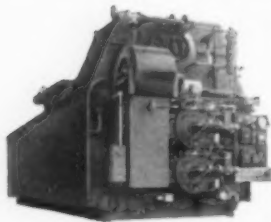


This boiler, built by Wickes Boiler Co. in 1875, operated satisfactorily for the next 31 years.

## When buying modern Boiler Equipment it pays to deal with an **EXPERIENCED MANUFACTURER**

There is no substitute for experience. From the first pioneering days in boiler manufacture, years before the boiler pictured above was built, Wickes Boiler Co. has continued to be a world leader in the development of economical, efficient and dependable steam generators. Today, Wickes builds steam generators in sizes to 500,000 lbs. of steam per hour, for high or low steam pressures and temperatures and for all types of fuels and firing methods.

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# WICKES

175

**WICKES BOILER CO.** DIVISION OF THE WICKES CORPORATION, SAGINAW 14, MICHIGAN

## **Facts and Trends (Continued)**

- ◆ **HOW SUBSIDY GROWS** — Once federal subsidies start, they don't just grow, they explode. Recently released government figures on subsidies for local housing projects illustrate this point, according to the Chamber of Commerce.

In 1950, through federal subsidies, taxpayers footed one-quarter of the payments on bonds for these housing projects. Last year, they paid nine-tenths of the bond payments. The payments were on principal and interest. In 1950 the program cost \$5.7 million. Last year it cost \$131 million. What's more astounding, the federal government is committed to subsidize housing for as far in the future as 2000 A.D. The program will cost taxpayers at least six and one-half to seven and one-half billion dollars.

- ◆ **REACTOR FOR GEORGIA TECH** — Groundbreaking ceremonies for Georgia Tech's long awaited Nuclear Research Center were held October 20 at the site of the Center, on the Tech campus.

The Tech Nuclear Research Center is valued at over \$4,000,000 and will be built by Blount Brothers Construction Company of Montgomery, Alabama. Designed by Robert and Company Associates of Atlanta, the new Center will include a research reactor. The new Center will also include a complex of associated laboratories and office areas.

- ◆ **1,000,000 KW** — A Westinghouse engineer has predicted that turbine generators rated at 1,000,000 kilowatts, twice as large as any now in use, will be producing power in the United States within the next 15 years. The largest unit in operation in the country today is rated at 475,000 kilowatts.

Westinghouse has determined that the higher rated units can be economically operated during a two-year study of the problem using a method called powercasting. Powercasting involves the use of computers to simulate detailed operations of a utility in the future. In effect, by programming the future into a computer, utility specialists are able to build a model electric system, in the computer, that will actually operate like a full scale system.

- ◆ **REPRINTS AVAILABLE**—Write the editors of SPI for small quantities of the following at no charge:

**SEGCO 1,000,000 KW PLANT**—A 16-page folder describing this large new Alabama plant, serving Alabama Power Co. and Georgia Power Co., is a combination of two technical articles from SPI's September and November issues.

**HOW EPOXY CAN SERVE YOU**—4 pages. Tells exactly how 10 separate repair jobs were handled and describes several epoxy mixes that are good for maintenance jobs.

**ORIFICE METER INSTALLATIONS**—Tells what the plant man needs to know about installation to get accurate, dependable service.

**INSPECTION REPORTS**—Tells how the station chemist can maintain information on the condition of boilers, cooling towers, condensers, heat exchangers, tanks and softeners. Actual inspection sheets are presented.

Write the editors for additional information on any of the above items.  
SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 8, Ga.



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 ARCHITECTS: G. Meredith Musick & Clayton C. Musick  
 ELECTRICAL CONSULTANTS: Swanson — Rink & Associates  
 ELECTRICAL CONTRACTOR: Howard Electric Co.  
 TOTAL FLOOR AREA: 77,400 square feet.

## Electrical Protection goes MODERN with BUSS Fuses... *in the New Service Center of the Public Service Co., of Colorado*

This recently completed service center, — located at 2701 West 7th Ave., in Denver, Colorado — has fuses installed throughout the entire electrical system.

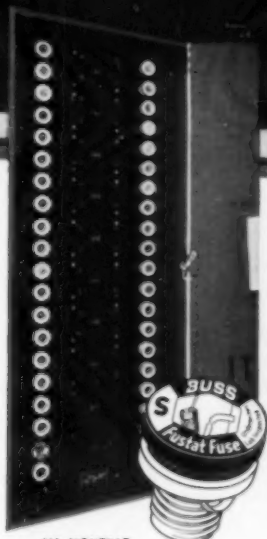
The primary voltage at the underground transformer vault is 13,800 volts, 3 phase, 4 wire. Secondary voltage is 120 and 208 — 3 phase, 4 wire.

Installed in the main service entrance are

BUSS Hi-Cap fuses; the sub-feeders are equipped with FUSETRON dual-element fuses and the lighting panels are protected by BUSS Fustat fuses.

Modern electrical protection calls for fuses because — fuses cannot be equalled by any other type of protective device for their combined high interrupting capacity, lifetime dependability and maintenance-free features.

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device*



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With available fault currents reaching 75,000 to 100,000 ampere  
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## **the SOUTH—SOUTHWEST**

**more power . . . more plants . . . more money**

### **Hooker Expanding at Columbus, Miss.**

Hooker Chemical Corporation is substantially expanding capacity for making Oldbury-brand sodium chlorate at the Columbus, Miss., plant of its Eastern Chemical Division.

With more chlorate cells and electrical equipment required, the expansion program is utilizing space provided earlier in existing buildings, and is employing finishing equipment now on hand. Construction is well under way and the new production is expected at the beginning of 1961.

Much of the sodium chlorate produced at Columbus is sold to the pulp and paper industry to make chlorine dioxide, a bleaching agent used to provide a high degree of whiteness with high paper strength.

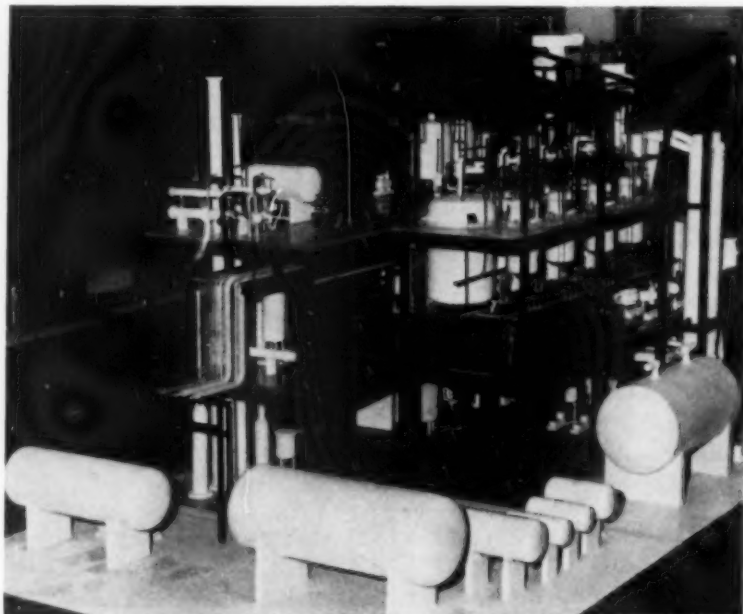
### **\$95 Million for Armco Construction**

Armco Steel Corporation has announced a \$95-million construction program with major new facilities to be built at the Ashland, Ky., and Houston, Texas, plants. The program is another step in Armco's \$341-million five-year improvement plan. Projects valued at \$101-million are already under construction.

Logan T. Johnston, Armco president, called the announcement Armco's vote of confidence in both the future of steel and the economic outlook for the nation.

"We are readying ourselves for the years ahead," he said. "Along with stepped-up merchandising efforts and greater emphasis on research and technology we are improving our plants in many ways. The facilities in this program will help us to compensate for the rising costs of steelmaking. They will give us greater efficiency, further integrate our steel supplies with our rolling capacity, and allow us to make a wider size-range of products."

Major projects in the \$95-million program include new processing and finishing facilities at the Ashland



### **Goodrich-Gulf Builds Texas Chemical Plant**

Model of plant to produce a new type of high density polyethylene resembles the facility being constructed at Port Neches, Texas for Goodrich-Gulf Chemicals, Inc.

The process and the plant were developed to produce commercial quantities of "Ameripol" polyethylene by an improved version of the Ziegler activated-catalyst system.

The process imparts to polyethylene new highs in environmental stress cracking resistance and temperature embrittlement resistance without sacrificing processability. The development promises to expand the use of this material in blow-molded products, wire and cable shielding, and extruded pipe.

Works of the company's Armco Division, and a new combination slab and 160-in. plate mill at the Houston Works of the Sheffield Division. A number of smaller projects are also planned. The Ashland and Houston facilities are scheduled for completion in 1962.

At the Ashland Works, the added processing and finishing facilities will permit greater utilization of the full capacity of the plant's hot strip mill.

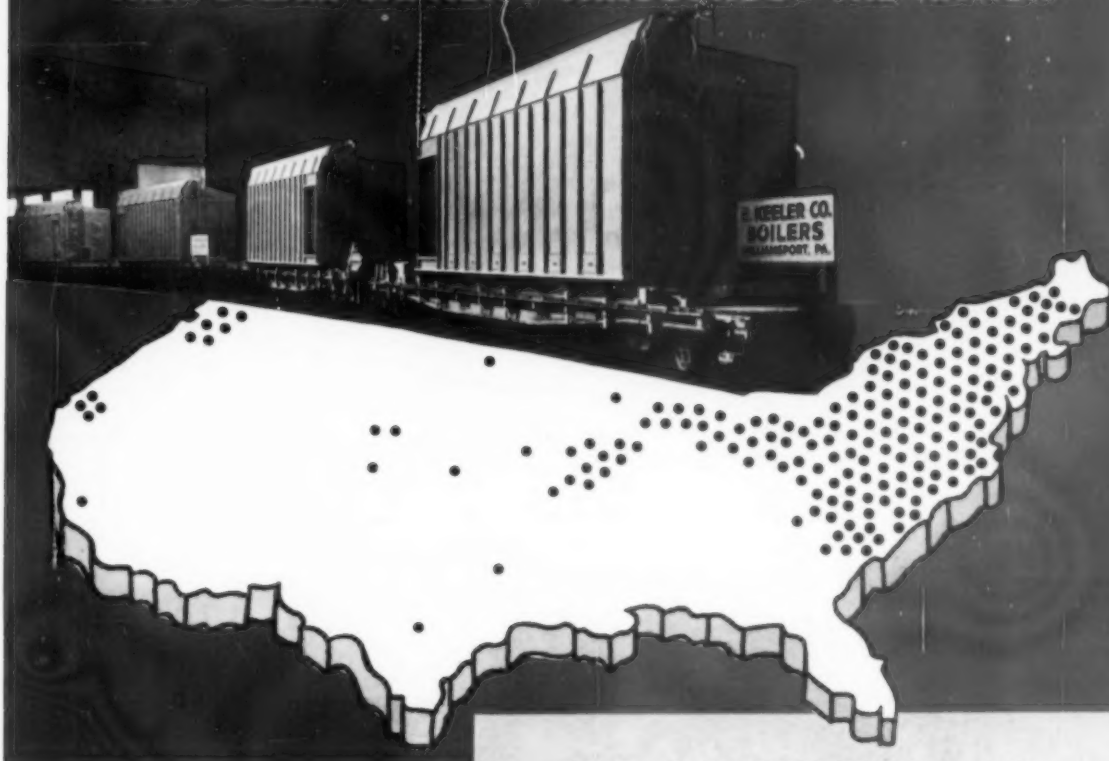
The addition of the combination mill at the Houston Works will enable Armco to produce wider and heavier plates for the rapidly grow-

ing plate market of the Southwest and Gulf Coast areas.

Mr. Johnston said, "We believe this is a favorable time for us to move ahead with this construction program. We can make our dollars stretch further now than we could six months ago. Also, the program is designed to have a minimum of interference with production schedules."

No new financing will be required for the program. The company borrowed \$75-million last year for construction purposes and the balance will come from retained earnings and depreciation.

# in 1959 alone, KEELER supplied OVER FOUR MILLION LBS/HR NEW STEAM CAPACITY THROUGHOUT THE NATION



## A MILLION POUNDS/HOUR MORE STEAM CAPACITY THAN THE YEAR BEFORE

Each dot on the map represents a new Keeler Steam Generator sold during 1959. The group included units for all fuels, all types of firing—for power, process, heat and special steam needs. Total capacity was over 4 million lb/hr—a 1 million lb/hr increase over the previous year.

Yes, Keeler is one of the nation's leading manufacturers of steam generators—from low cost package units up to 100,000 lb/hr and field erected units up to 200,000 lb/hr. Write for full data . . . nearly a century of versatility, economy, dependability and experience are yours when you specify and insist upon Keeler quality for your steam requirements.

### E. KEELER COMPANY

West & Church Sts. • Williamsport, Penna.

—OFFICES IN PRINCIPAL CITIES—

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ESTABLISHED  
1864

The Seal of  
Quality  
in  
Water Tube  
Steam  
Generators



## KEELER STEAM GENERATOR SALES — 1959

\*Indicates more than one unit

ALTOONA SCHOOL DISTRICT  
AMITY DYEING & FIN. CO.  
ANDERSON MEM. HOSPITAL\*  
ANDREWS AIR FORCE BASE,  
John H. Towers Field\*  
ATLAS WAREHOUSE & COLD  
STORAGE COMPANY

BETHLEHEM STEEL CO.\*  
BOYS INDUSTRIAL SCHOOL  
BRAMBLE CANNING CO.\*  
BUNKER HILL A.F. BASE  
BZUNA, INC.\*

CARSON PECK MEM. HOSP.\*  
CENTRAL INTEL. AGCY.\*  
CHARLESTON GENL. HOSP.\*  
CHARLOTTE MEM. HOSP.\*  
CHRISTIAN COLLEGE\*  
CIRCLE WIRE & CABLE CO.  
CONTINENTAL CAN CO.\*  
CORLIN PROCESSING CO.  
CORNELL DUBILIER ELEC.  
COTTAGE HOSPITAL  
CRUMDEN MARTIN MFG. CO.\*  
CURTIS PAPER COMPANY

DARST APARTMENTS  
DOVER GENERAL HOSPITAL  
DRESDEN NUCLEAR POWER  
STATION\*

DURK OF MINNESOTA

FAIRFAX COUNTY HOSPITAL\*  
FEDERAL CORRECT. INST.  
FIBER INDUSTRIES, INC.\*  
FRANKFORT DEPT. OF HEALTH

GENERAL ELECTRIC COMPANY  
GENERAL REFRACTORIES CO.  
GERMANTOWN HIGH SCHOOL\*  
GLOBE RUBBER COMPANY  
GOOD SAMARITAN HOSPITAL  
GOTTSLIEB MEMORIAL HOSP.\*  
GREELEY CAPITOL PKG. CO.\*  
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HAVERFORD MENTAL HEALTH  
CENTER\*

HENRY HEYWOOD MEMORIAL  
HOSPITAL  
THE HILL SCHOOL  
HOWARD COUNTY HOSPITAL\*  
INGERSOLL HAND COMPANY  
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KEASBY & MATTISON  
KENNEDY & BRITT, INC.  
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MADISON COLLEGE  
MANCHESTER COLLEGE  
MANDAN CREAMERY & PROD.  
MD.-VA. MILK PRODUCTS  
MASONIC HOME, Burlington  
MASONIC HOME, Elizabethtown  
MERIDOTTA STATE HOSPITAL  
MERCER CO. HOME & HOSP.\*  
MERCY HOSPITAL, Brooklyn\*

MERCY HOSPITAL, W.B.\*  
MORGAN STATE COLLEGE\*  
MORNINGSTAR-PAISLEY, INC.  
MT. ALOYSIUS JR. COLLEGE  
MUSKINGUM COLLEGE

NORFOLK SOYBEAN PROCESS-  
ING PLANT  
NU-METHOD DYEING &  
PROCESSING CO.

OHIO SOLDIERS & SAILORS  
ORPHANS HOME\*

OUR LADY OF LOURDES HOSP.\*  
PARMA COM. GENL. HOSP.\*  
PATUXENT INSTITUTION  
S. D. PENICK CO., INC.

PENN DAIRIES, INC.  
PHILCO CORPORATION  
POTTSVILLE HOSPITAL  
PUEBLO ORDNANCE DEPOT

RAYBESTOS MANHATTAN CO.  
RAYWIN REALTY COMPANY  
REED COLLEGE  
RICHMOND-CHASE COMPANY  
ROCHESTER & PITTSBURGH  
COAL COMPANY  
JULIUS ROENRS CO.  
ROSS PUMPING STATION\*  
ROVEL REALTY CORP.

S & P LAUNDRY  
ST. AGNES HOSPITAL\*  
ST. JOSEPH HOSP., S. J., Mo.\*  
ST. JOSEPH'S HOSP., K.C.\*  
ST. JOSEPH'S MERCY HOSP.  
ST. VINCENT'S HOSPITAL  
SAN FRANCISCO HALL OF  
JUSTICE\*

SEARS, ROEBUCK & CO.\*  
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HOIST COMPANY\*  
SIBLEY MEMORIAL HOSP.\*  
J. P. STEVENS & CO.  
CHAS. G. SUMMERS, Jr., Inc.

TEXAS STATE OFFICE BLDG.  
JOSEPH THOMAS FLORISTS  
TITAN METAL MFG. CO.\*

UNION CARBIDE CHEM. CORP.\*  
UNITED AIRLINES  
UNITED PIERCE DYE WKS.\*  
U. S. ARMY HOSP., Ft. Lee\*  
U. S. BUREAU OF PRISONS\*  
U. S. GYPSUM COMPANY  
U. S. NAVY, Kingsley Field

VALLEY HOSPITAL\*  
VICKERS PETROLEUM CO., Inc.  
VICTOR BALATA & TEXTILE  
BELTING COMPANY

WEST CHESTER S.T. COLLEGE  
WESTERN PA. STATE SCHOOL  
& HOSPITAL\*  
WESTERN STATE HOSPITAL  
WEST SEATTLE HIGH SCHOOL  
WONDERKNIT CORPORATION

## News Briefs (Cont.)

### Copolymer Addition at Baton Rouge

Copolymer Rubber and Chemical Corporation announced plans for construction of a \$750,000 building adjacent to its Baton Rouge, Louisiana, plant. The 25,000 sq ft two story structure will house executive and administrative offices.

All exterior walls will be built of pressed steel frames and glass window walls with opaque glass exterior panels. Vertical blinds will be installed behind windows, and exposed steel columns will be faced with ceramic tile. Open type design will be used to provide maximum usable space, with a minimum of halls and dead space, as well as flexibility in enlarging or decreasing departmental areas. A. Hays Town is architect. After site preparation, construction will take about one year.



### Newport News Plant

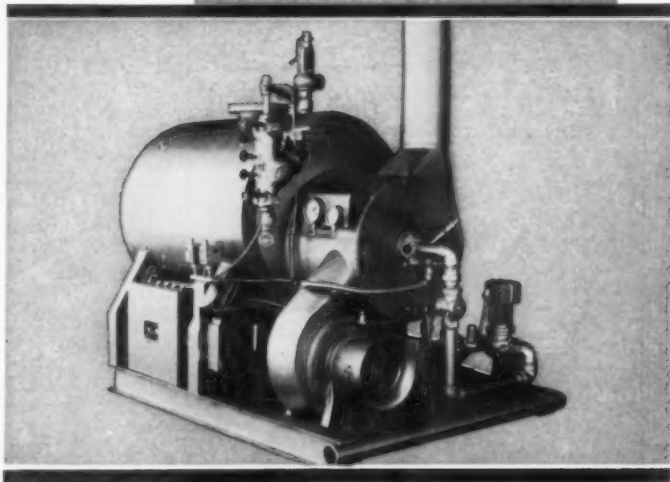
Johnson & Wimsatt, Inc., manufacturers and wholesalers of lumber and millwork in Virginia and the Carolinas, recently dedicated a new \$600,000 plant at the Copeland Industrial Park in Newport News.

The combination office and warehouse was designed by Forrest Coile & Associates, and built by Virginia Engineering Co., Inc. It occupies a 31-acre site, and includes 85,000 sq ft of roofed space. Total value of the property, including machinery and inventory, approaches \$1,250,000.

Eventually the company plans to add a wood treatment plant and a special millwork manufacturing plant.

An unusual structural feature of the building is the use of huge steel spans for roofing, creating a completely unbroken interior space, 210 ft wide and 350 ft long. Surrounding the roof of the warehouse area are cathedral-like, blue green windows which allow a high light level even on dull days. Other design features include a sprinkler system throughout, a private railway siding for supply movement, and an intercom system to expedite pickups.

## TXT COST-SAVING



# SAVES

- Installation Costs
- Valuable Space
- Operating Costs
- Repair Costs
- Operating Time

## VAPORMATIC COIL-N-SHELL STEAM GENERATOR

Economical, efficient, long lasting . . . the Textsteam Vapormatic Coil-N-Shell Steam Generator means savings to you in every respect! You save on installation costs because the Coil-N-Shell requires no special foundation. The entire unit is assembled on steel skids, shipped ready to fire up when installed. Forced draft fan eliminates the need of a costly high stack and its compact design saves valuable floor space. Lower operating costs result from fuel economy and lower maintenance costs from easy accessibility of all parts for inspection, adjustment or minor repairs.

The Coil-N-Shell Vapormatic generates steam from a cold start in ten minutes and is ready for line service immediately. It is completely automatic and all sizes have modulating controls as standard equipment. Available with gas, light oil or combination gas-oil fuel burning systems. Flow rating selection between 1725 to 10,350 pounds of steam per hour (50 to 300 HP), will maintain its rated capacity output throughout its long duty life cycle. Available at selective outlet pressure of 5 to 145 psig.

No other steam generator offers so many benefits for so little cost. Write for bulletin 582 CSB for complete specifications and operating data.

Factory trained service man will assist in the inspection of the final installation, instructions of operating personnel and assist in initial start.

# TXT

A DIVISION OF  
VAPOR HEATING  
CORPORATION

TEXSTEAM CORPORATION

320 Hughes St. • P. O. Box 9127 • Houston 11, Texas • WA 6-8853

## S. C. Atomic Power Plant Under Construction

Ground has been broken at Parr, S. C., for the Southeast's first atomic power project. The ceremony marked the beginning of construction of the 17,000 kilowatt generating station of **Carolinas Virginia Nuclear Power Associates, Inc.**, a utility group made up of Duke Power Company, South Carolina Electric and Gas Company, Carolina Power and Light Company and Virginia Electric and Power Company.

The plant will be completed in mid-1962. Westinghouse Electric Corporation's atomic power division is responsible for development and design of the reactor plant and is furnishing equipment for it. Stone & Webster Engineering Corporation is architect-engineer for the plant.

The utilities will have an investment of about \$28 million in the project. The U. S. Atomic Energy Commission's cost under its power demonstration reactor program will be about \$15 million.

The CVNPA reactor plant will differ from existing atomic power plants in two basic ways.

The project represents the first time private companies have invested in a reactor that will use heavy water both as a coolant and moderator. The moderator slows down "fast" neutrons so that they can carry on a self-sustaining fission process. Until now, most commercial atomic reactors have used ordinary water as the moderator.

When the Parr reactor begins operation, the fission process will raise the temperature of the pressurized heavy water to 555 F. This heavy water will pass through a heat exchanger to produce steam that will then be piped to a turbine-generator unit in a nearby existing utility plant. While heavy water requires processing and is more expensive initially, its use offers the potential of developing large power reactors which need only natural uranium for fuel.

The new reactor will also eliminate the large pressure vessel which has been a basic component in previous pressurized water reactors. Instead of the heavy steel vessel that houses the entire core and its structural support, the CVNPA reactor will have pressure tubes installed in a relatively simple and low pressure tank. The 42 U-shaped pressure tubes which will accomplish the same function at Parr will each weigh 750 pounds and will be 4 inches in diameter and 19 feet long.

(Continued on page 22)



It is better not to. The best protection is to clean down to bare metal, then paint. But this isn't always possible. What then?

The following Subox system provides the next-best protection:

1. Remove all the loose rust. Loose rust cannot bond any paint.
2. Apply a coat of Subox Primer. This is made with specially-treated vehicles and minute particles of lead suboxide to penetrate through firm rust to the metal surface. The lead suboxide remains chemically active to give anchor-bolt adhesion and maximum rust inhibition.

Subox Primer is exceptionally weather durable. It alone will provide protection for a long time. It will not crack, peel, chip or blister. It combines readily with finish coating, and even when the latter has worn away will continue to safeguard the metal surface.

Each year more construction and maintenance engineers specify Subox Primer.

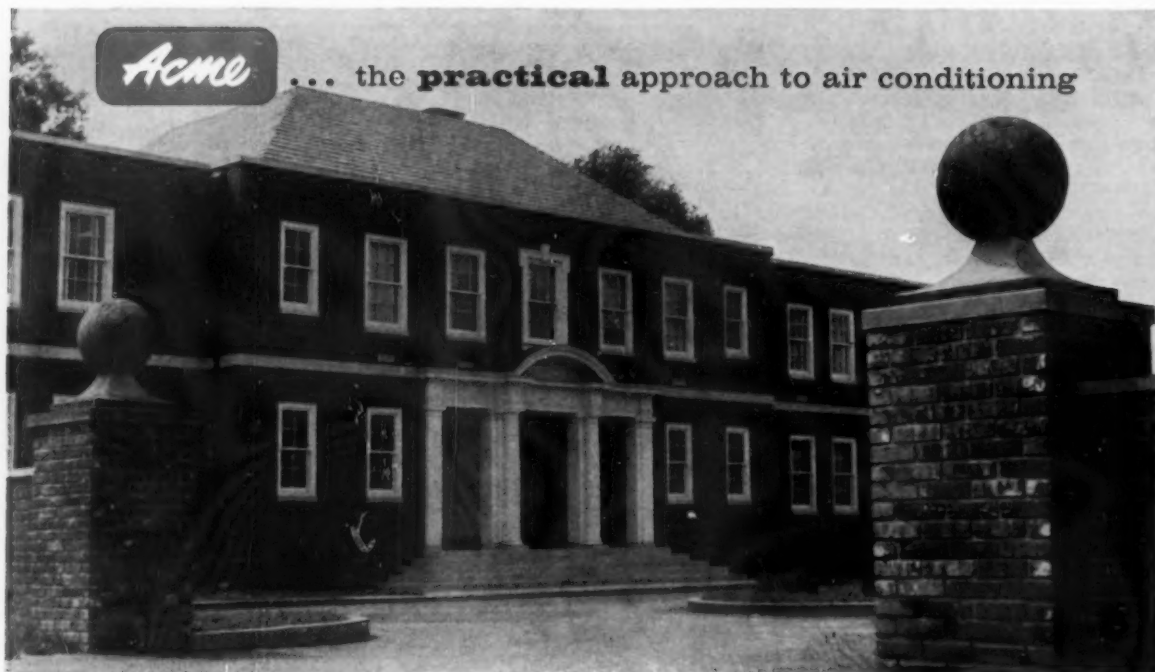
Send for literature and color card.

# SUBOX PAINTS

**Subox Inc.**

Trade Mark

6 Fairmount Plant  
Hackensack, N. J.



... the **practical** approach to air conditioning

Architects, Nevin & Morgan, Louisville

## *Acme*... saves on installation ... cuts down on running costs

Resounding is the only word for the chorus of "ayes" in favor of the Acme air conditioning system now comfort cooling the Carver School of Missions & Social Work at the Southern Baptist Theological Seminary, Louisville, Kentucky.

Roy B. Sanders, mechanical contractor, is an old "Acme hand", having installed Acme units in the Kentucky State Police Barracks and Municipal Building, Frankfort General Hospital, Louisville, in addition to this job. And according to Roy "Acme is outstanding because it comes in smaller packages than any other equipment of comparable efficiency . . . it's simple to handle, simple to install. In fact, counting

materials and man hours, Acme saves me about 10% on installation."

E. R. Ronald, consulting engineer, states "Acme equipment easily fits the architectural specifications we have to follow and we consider it the equal of any more publicized unit in the country."

And the end consumer? Michael L. Speer, Director of Administration for the School says "*Acme couldn't be surpassed for a private institution* such as Carver School. It supplies a maximum of comfort with a minimum of operation. It cuts down on running costs."

Why not join the ranks? There's an Acme sales engineer near you who'll be happy to "sign you up".

**Acme** INDUSTRIES, INC.  
JACKSON, MICHIGAN • GREENVILLE, ALABAMA

MANUFACTURERS OF QUALITY AIR CONDITIONING AND REFRIGERATION EQUIPMENT SINCE 1919



Packaged Chillers  
1½-250 tons

Remote Room Conditioners  
200-600 cfm

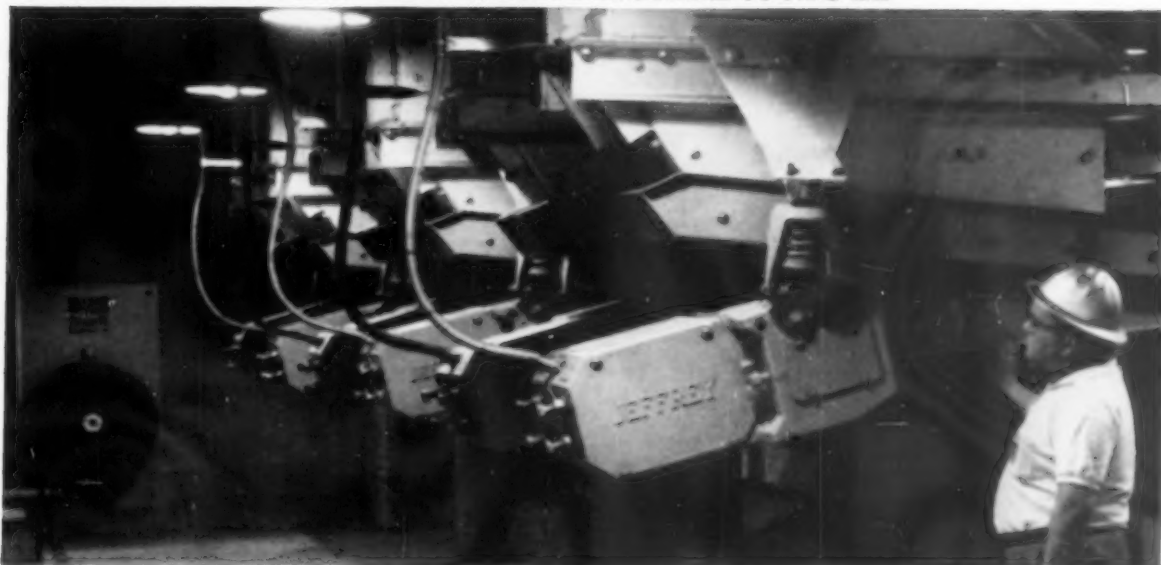
Cooling Towers  
3-120 tons

Packaged Air Conditioners  
3-60 tons

Evaporative Condensers  
10-110 tons

Air Handlers  
665-47,000 cfm

# What's NEW in Mechanization



**AUTOMATIC FEED HOLDS STEEL COST DOWN**—Jeffrey equipment plays a key role in the steel industry's war on costs. This battery of Jeffrey vibrating feeders, in a huge taconite processing plant, measures out and feeds 45 tons of taconite every minute, on a 24-hour-a-day, year-round pace. Jeffrey feeders automate proportioning and feeding of raw materials in all basic industries.



**NEW SYSTEM RECOVERS VALUABLE WASTE**—To eliminate loss of coke fines at an oil refinery, Jeffrey designed and built this system to wash the fines in water, pass them through a settling tank, and separate the fines. Similar Jeffrey equipment is used in treatment of water, sewage, and industrial waste.

Mechanization

for every basic industry



## "LIBRARY OF MATERIALS" OFFERS ANSWERS TO PULVERIZING PROBLEMS

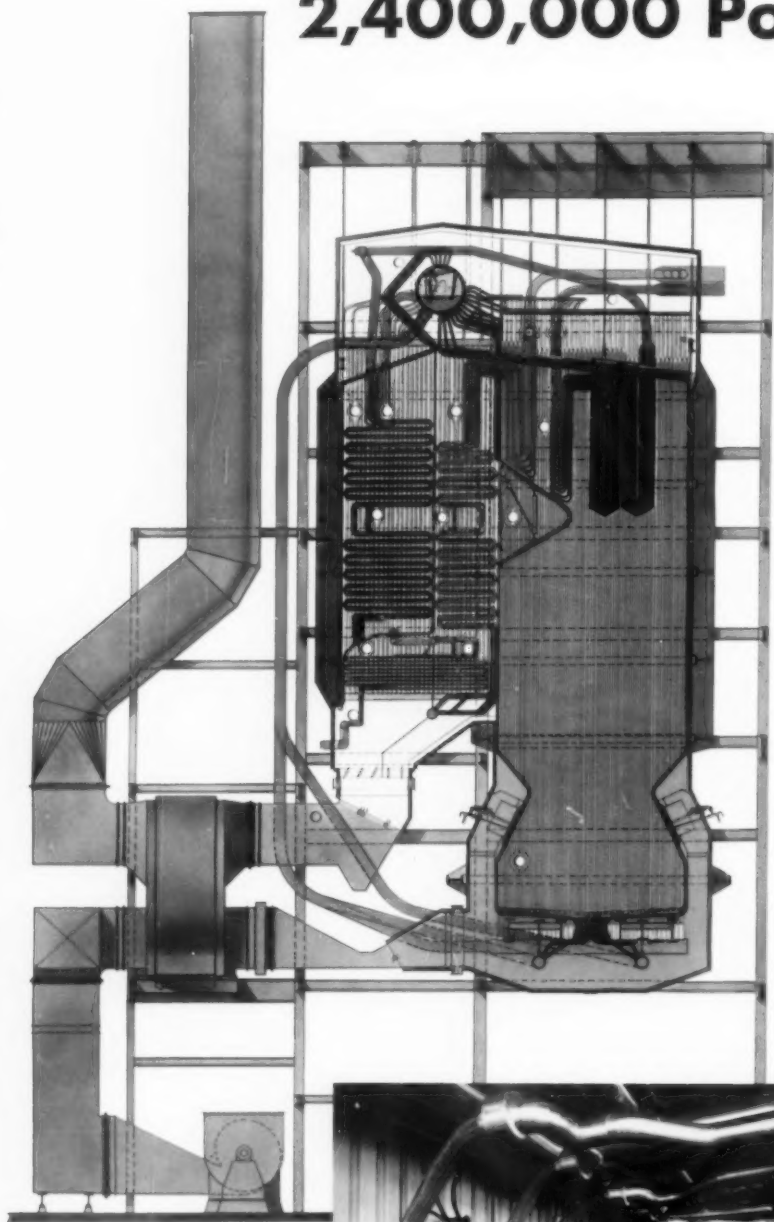
These materials samples have been evaluated and tested by Jeffrey's Crusher Laboratory. Often a new materials reduction problem can be answered from data kept on file from hundreds of tests. This helps basic industries obtain the most efficient, dependable crushers and pulverizers from Jeffrey.

Jeffrey serves every basic industry with *mechanization*...conveying and processing equipment, transmission and mining machinery. Sales-engineering service world-wide; standard products stocked by authorized distributors. The Jeffrey Manufacturing Company, 898 North Fourth Street, Columbus 16, Ohio.



**JEFFREY**

# Two **RILEY** TURBO FURNACE 2,400,000 Pounds of Steam



*A careful survey of your plant by a qualified consulting engineer could show ways of making substantial savings in power costs.*



At the new North Lake Steam Electric Station the first of two Riley Turbo Furnace Reheat Boilers recently purchased by Dallas Power & Light Company is now on the line. Distribution of furnace gases is exceptionally uniform with minimum metal temperature variations across the full widths of reheater and superheater. Superheat and reheat temperatures are maintained over required control ranges. Boiler operates continuously at design rating for long periods. Extreme ease of operation with minimum operating personnel results from all burners being located for opposed firing on *one* level. Steam temperature is mainly controlled by automatic dampers located below the economizers.

Several other Southwestern Public Utilities have installed the Riley Turbo Furnace Boiler because its design and method of firing permits quick, easy and low cost conversion from natural gas to other fuels.

#### ENGINEERING DATA

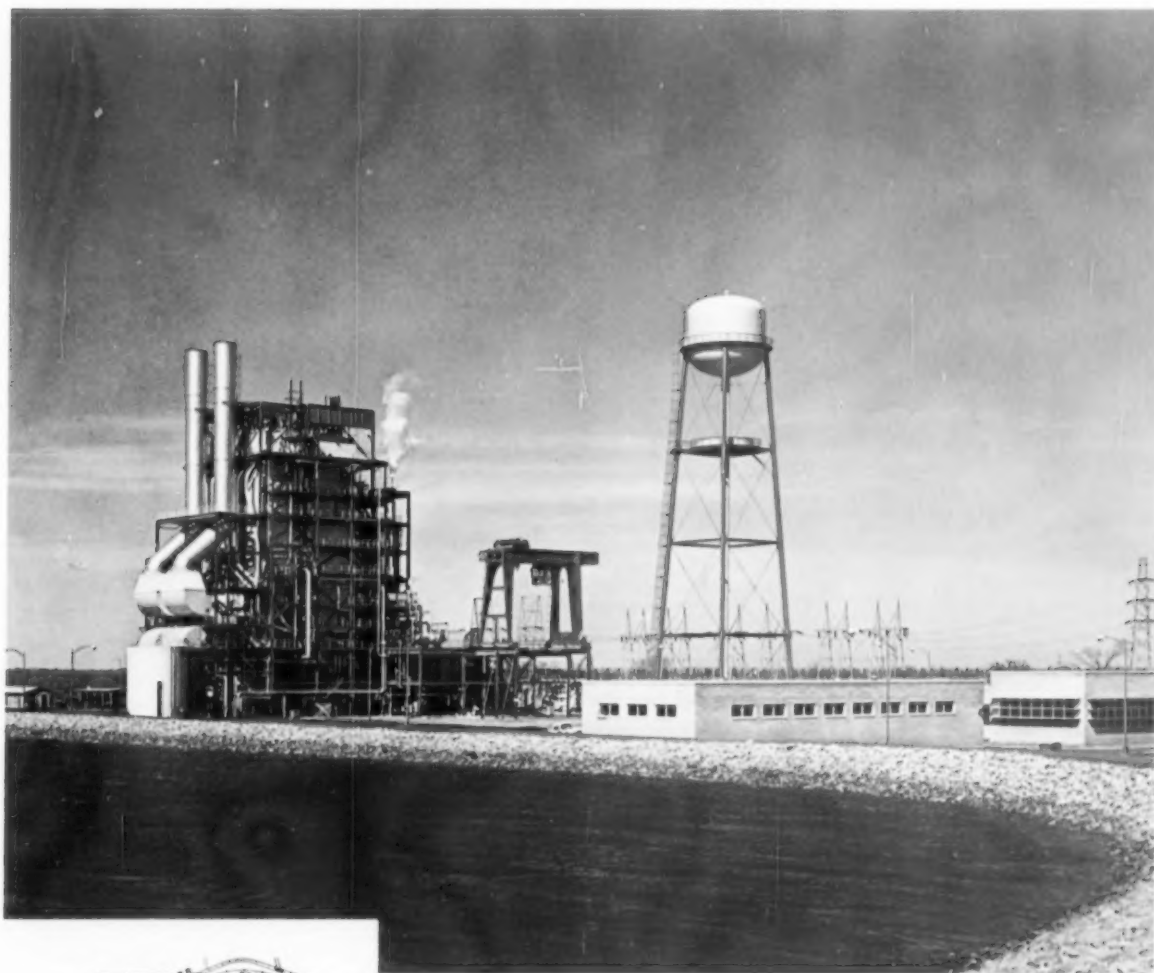
Capacity — 1,200,000 lbs/hr  
Pressure — 2125 psig  
Superheat — 1005F,  
Reheat — 1005F  
Fired by Natural Gas, Oil

**EBASCO SERVICES, INC.**  
Consulting Engineers

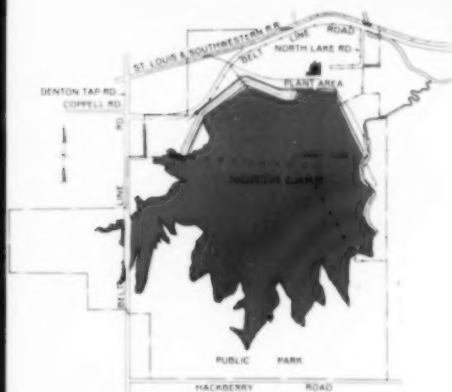
One of two firing aisles located on opposite sides of the furnace shows ten Riley Directional Flame Turbo Furnace Burners. The Turbo Furnace single level burner arrangement minimizes operating supervision and maintenance.

# Reheat Boilers will produce for *Dallas Power & Light Company*

NORTH LAKE STEAM ELECTRIC STATION



North Lake is an 800 acre man-made lake constructed for cooling water by Dallas Power & Light. Most of its area is open to public boating and fishing. Here is an unusual use of a private power company's facility. Much credit is due to Dallas Power & Light Company for imaginative and public spirited foresight.



## **RILEY**

STEAM GENERATING & FUEL BURNING EQUIPMENT  
RILEY STOKER CORPORATION, WORCESTER, MASSACHUSETTS.

**Sales Offices:**

Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Jacksonville,  
Kansas City, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh,  
Portland, Salt Lake City, San Francisco, St. Louis, St. Paul, Seattle, Syracuse.

**Quality costs less in the long run**



**"BLUE RIBBON" boiler feed pumps  
for every application . . .**

Demands for higher pressures and capacities in modern boiler feed pumps have also created a need for higher speeds and greater reliability.

And in boiler feed pumps — as in every other type of centrifugal — Byron Jackson can match any requirement with a quality, performance-proved pump.

From direct turbine-generator driven models, such as the giant 12,000 horsepower, 3,600 rpm unit above, to the compact, 15,800 rpm marine boiler feed pump shown at the left, BJ designs are inherently reliable. Built-in balance, minimum NPSH requirements, and simple, effective sealing are common to all BJ Quality Pumps for the power industry.

*Quality does cost less in the long run!*

**Byron Jackson Pumps, Inc.**

subsidiary of Borg-Warner Corporation

P.O. Box 2017A, Terminal Annex, Los Angeles 54, Calif.

**BJ**

Since 1872

**A STANDOUT UNDER ANY TEST**

# **DETROIT ROTOSTOKER C-C** (Continuous Cleaning)

In any test you  
want to apply  
**DETROIT  
ROTOSTOKER C-C**  
(Continuous Cleaning)  
will stand out

Detroit RotoStoker C-C (Continuous Cleaning) with reciprocating grates that continuously clean the fire and discharge ash at the front, where it may be taken from the ash pit at floor level if desired, avoiding need for a basement ash bunker. High sustained efficiency, high availability low power for operation — For boiler capacities from 5,000 to 75,000 pounds steam per hour.



Efficiency, availability, flexibility under fluctuating load, ability to burn good or low grade coals or waste materials, durability, low parasite power consumption and low maintenance. RotoStoker C-C scores high on all points.

Among those who have tested the RotoStoker C-C — found it a winner — are such well known names as:

Allied Chemical & Dye Corporation  
Alpena Power Company  
American Cyanamid Company  
American Radiator and Standard Sanitary Corp.  
The Electric Auto-Lite Company  
Automatic Electric Company  
Carlisle Tire & Rubber Company  
Columbian Carbon Company  
Darling and Company  
E. I. du Pont de Nemours and Company  
General Motors Corporation  
General Tire & Rubber Company  
Manchester Board and Paper Company, Inc.  
National Gypsum Company  
Newberry State (Mich.) Hospital  
Pittsburgh Steamship Company  
U. S. Dept. of Defense  
Wake Forest College

RotoStoker C-C is typical of the Dependable Detroit Line which includes stokers for efficient firing of boilers from 3,000 to 400,000 pounds per hour steam capacity.

DETROIT STOKERS COST LESS: COST EQUALS INITIAL INVESTMENT PLUS UPKEEP PLUS PRODUCTION LOSSES DUE TO EQUIPMENT OUTAGE. THE TOTAL IS LESS WITH DETROIT.

8139

Write **DETROIT STOKER COMPANY**

DIVISION OF UNITED INDUSTRIAL CORPORATION

**MAIN OFFICE AND WORKS • MONROE, MICHIGAN**

District Offices or Representatives in Principal Cities

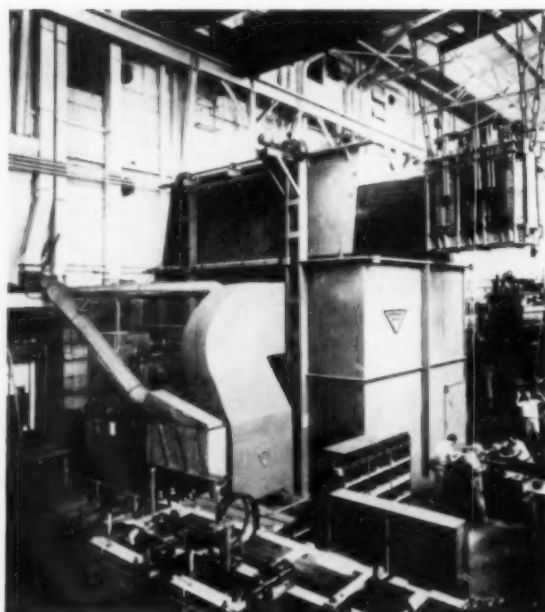
## News of the South-Southwest

(Continued from page 15)

### New Oven for Wagner — St. Louis

This 75-ton overhead crane lowers a powerful industrial transformer into the new Despatch-built drying oven for **Wagner Electric Company**, St. Louis. Gas-fired, the new oven has interior dimensions of 15' wide, 22' long and 17½' high. Air is circulated at 13,500 cfm, and a complete change occurs every 3-1/3 minutes. Rated at 250 F max, the oven is able to handle one-third more products than the previous system used. Safety interlocks prevent starting of heating cycle while doors are open, and complete shutdown in event of overheating. Temperature must not exceed the rated maximum or transformers, which range in value up to \$250,000 each, will be damaged.

According to Wagner Electric Company officials, the new Despatch oven, which was installed as part of a revamping of the transformer drying system, provides larger capacity, increased versatility, and definitely cleaner and more economical operation.



### FUTURE EVENTS of Engineering Interest

**Nov. 28-Dec. 2: 24th National Exposition of Power & Mechanical Engineering**, New York Coliseum. International Exposition Co., E. K. Stevens, Mgr., 480 Lexington Ave., New York 17, N. Y.

**Nov. 28-Dec. 2: ASME Winter Annual Meeting**, Statler Hilton Hotel, New York. Sec'y, American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y.

**Dec. 12-15: Industrial Building Exposition & Congress**, New York Coliseum. Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

**Jan. 20, 1961: Gulf Coast Regional Meeting**, Natural Gasoline Assn. of America, The Robert Driscoll Hotel, Corpus Christi, Texas. Wm. F. Lowe, Exec. Dir., 421 Kennedy Bldg., Tulsa 3, Okla.

**Jan. 23-26, 1961: Plant Maintenance & Engineering Show**, International Amphitheatre & Palmer House, Chicago, Ill. Clapp & Poliak, Inc., 341 Madison Ave., N. Y. 17, N. Y.

**Feb. 13-16, 1961: 15th International Heating & Air Conditioning Exposition**, International Amphitheatre, Chicago, Ill. American Society of Heating, Refrigerating & Air Conditioning Engineers, National Meeting. International Exposition Co., 480 Lexington Ave.,

New York 17, E. K. Stevens, Mgr.

**Feb. 24, 1961: South Louisiana Regional Meeting**, Natural Gasoline Assn. of America, Lafayette Petroleum Club, Lafayette, La. Wm. F. Lowe, Exec. Dir., 421 Kennedy Bldg., Tulsa 3, Okla.

**March 5-7, 1961: Southern Safety Conference & Exposition**, Atlanta Biltmore Hotel, Atlanta, Ga. W. L. Groth, Exec. Dir., Box 8927, Richmond 25, Va.

**March 15-17, 1961: 40th Annual Convention**, Natural Gasoline Assn. of America, The Baker Hotel, Dallas, Texas. Wm. F. Lowe, Exec. Dir., 421 Kennedy Bldg., Tulsa 3, Okla.

**April 5-7, 1961: AIEE Southeast District Meeting**, Jung Hotel, New Orleans, La. Sec'y, American Institute of Electrical Engineers, 33 West 39th St., New York 18, N. Y.

**April 12-13, 1961: AIEE Materials Handling Conference**, Hotel Sheraton, Philadelphia, Pa. H. A. Zollinger, Chm. AIEE Materials Handling Subcommittee, Westinghouse Electric Corp., Pittsburgh, Pa.

**April 28, 1961: Oklahoma Regional Meeting**, Natural Gasoline Assn. of America, Lake Murray Lodge, Ardmore, Okla. Wm. F. Lowe, Exec. Dir., 421 Kennedy Bldg., Tulsa 3, Okla.

### Plant Personnel

**Michael T. Borelli** has been promoted to superintendent of the newly formed Systems Engineering Section of The Chemstrand Corporation's Engineering and Development Department at Decatur, Alabama.

**Edward C. Newton** is vice-president and general manager of Johnson & Wimsatt, Inc., at Newport News, Va., where new facilities have recently been put into operation.

**Robert S. Godfrey**, fiber quality engineer at The Chemstrand Corporation Acilan acrylic fiber plant, Decatur, Alabama, has assumed new duties as a technical sales service representative.

### Spinks to Produce Adhesives — St. Louis

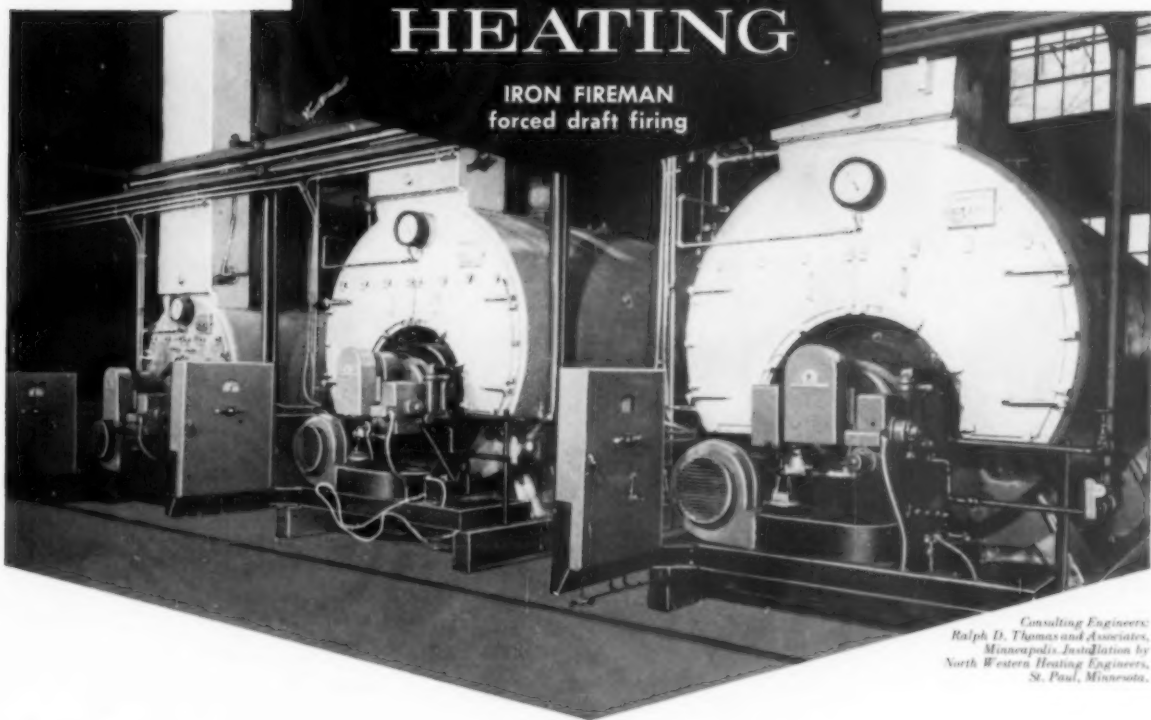
Expansion of **H. C. Spinks Clay Co.** of Paris, Tenn., a long time factor in the ball clay field, into adhesives manufacturing has been announced by R. B. Carothers, Jr., executive vice-president. The firm has bought Hayes Adhesives Co. of St. Louis, which will be operated as a new manufacturing and marketing division.

Additional plant units will be added as needed. Mr. Carothers said he thought present shipping facilities would suffice but that additional laboratory personnel and equipment would be required.

(Continued on page 68)

# The new world of HEATING

IRON FIREMAN  
forced draft firing



Consulting Engineers:  
Ralph D. Thomas and Associates,  
Minneapolis. Installation by  
North Western Heating Engineers,  
St. Paul, Minnesota.

## This new heating plant increased boiler capacity 70%, yet will return the investment in 7 years

The Minnesota Masonic Home in Minneapolis faced a problem that is familiar to many owners of old heating plants—should the old plant be modernized or replaced?

After a thorough study of several alternatives, the engineering firm of Ralph D. Thomas and Associates recommended a complete replacement. The three Iron Fireman-Kewanee boiler-burner units shown above provide extra capacity for future needs, while cutting steam costs so sharply that engineers estimated they will pay for themselves in seven years.

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Please send complete technical description and specifications on Iron Fireman forced draft firing.

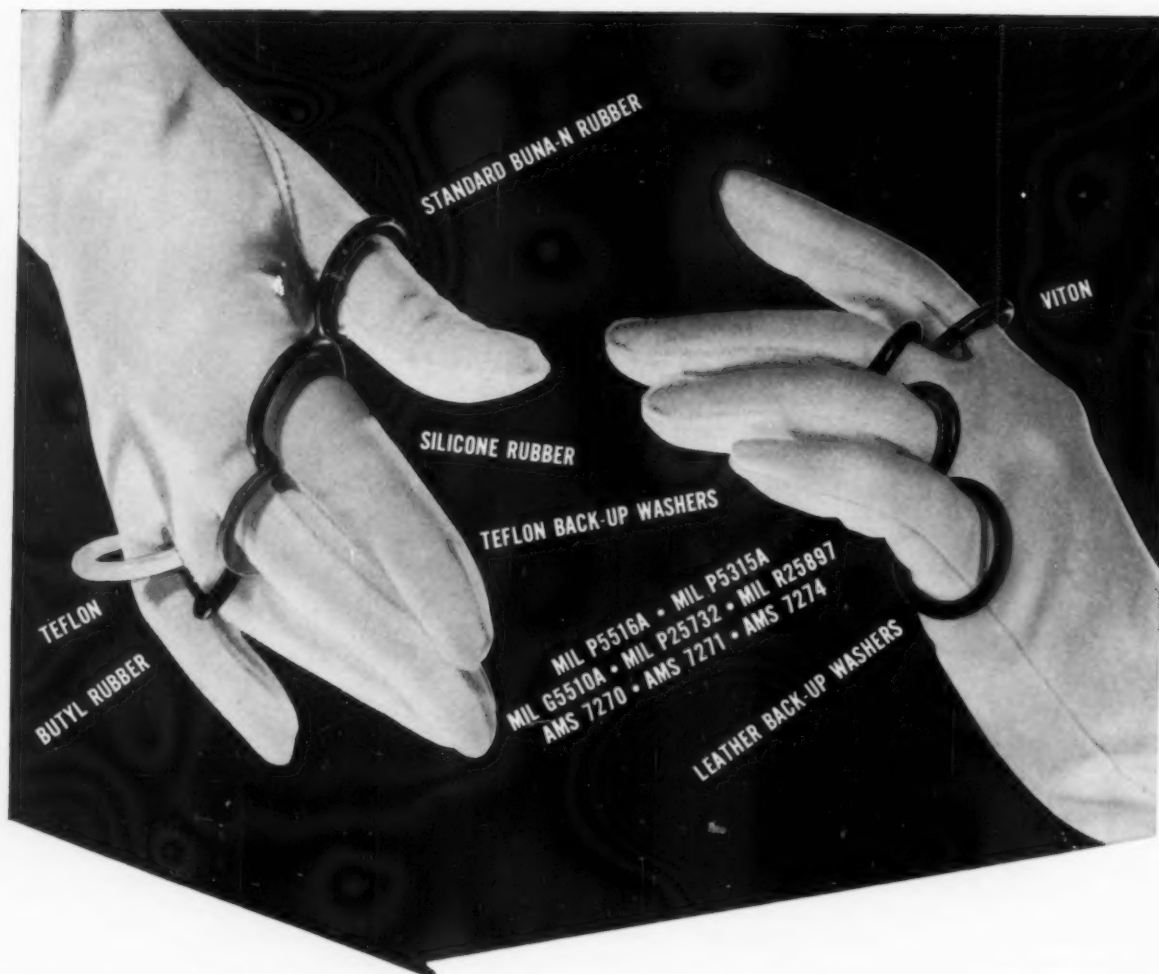
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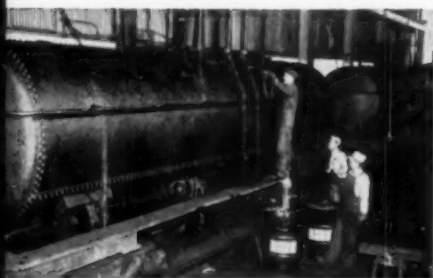


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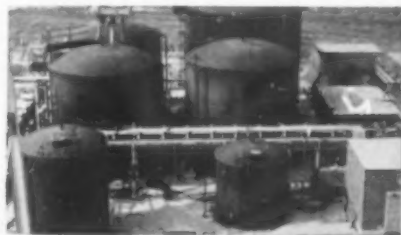
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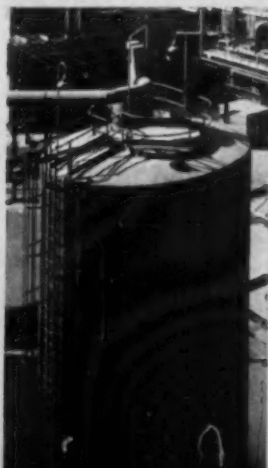
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# INDUSTRY SPEAKS



## Reducing Physical Distribution Costs

### Seen as Method of Minimizing Cost-Price Squeeze

**IF THE COST-PRICE SQUEEZE** now plaguing businessmen is to be minimized, an all-out attack will have to be mounted on reducing costs of physical distribution which are today, after raw materials and labor, the third largest cost of doing business.

This suggestion came from Allan Harvey, president of Dasol Corporation, in making public an audit summary of inventory carrying charges prepared to help presidents quickly evaluate such costs in their own companies. Dasol is a group of consulting management engineers which specializes in systems for the automation of physical distribution, warehousing, inventory management, and control data.

"Failure of the soaring Sixties to materialize, debates among businessmen as to whether a recession has or has not arrived, and a succession of annual reports showing time after time that sales are up and profits down, have directed attention on the part of company presidents to target areas for major cost reduction.

"Nowhere are there greater possibilities for cost reduction than in physical distribution. In all its ramifications distribution includes transportation, materials handling, warehousing, inventory control, production planning and administration.

"A recent survey shows that inventory carrying charges for all industry have an annual range between 13.8% and 35.9% of the actual inventory cost. The eight elements which make up these costs of carrying inventory are analyzed approximately as follows: cost of money 4.5% to 7.0%; taxes 0.5% to 2.6%; insurance 0.2% to 1.0%; warehouse expense 0.2% to 2.3%; physical handling cost 2.0% to 4.0%; clerical and inventory control 1.0% to 4.0%; obsolescence 3.9% to 10.0%; deterioration and pilferage 1.5% to 5.0%."

In discussing costs of money Mr. Harvey explained:

"Suppose it is possible for a company to reduce its inventory by \$1 million. If the company normally borrows either long or short term at an interest rate, for example, at 5%, this would result in an automatic saving of \$50,000. If on the other hand, the saving of \$1 million can be utilized in business expansion and more frequent money turnover, the amount in sav-

ings can conceivably be a substantially higher figure, representing that amount that the company could expect to earn out of funds that have been released.

"It is possible to approach each of the other elements in the cost of carrying inventory and effect savings which would be translatable into net profits.

"The big problem is to work out a system which would enable management to meet its merchandising, sales and production obligations efficiently and at the same time to effect a reduction in inventory requirements and the consequent inventory carrying charges."

## Shipping Coal by Pipe Line

**INITIAL ASSIGNMENT** of W. T. Thagard, recently appointed vice-president of Texas Eastern Transmission Corporation, will be to direct and expedite Texas Eastern's diversification activities in the field of carrying coal by pipe line.

Texas Eastern and Consolidation Coal Company are working on a joint project to carry coal by pipe line from West Virginia mines to distant electric utility companies. The management of Texas Eastern now feels that this project has progressed to the point where it requires the direct supervision of an officer of Texas Eastern. Mr. Thagard, because of his close identity with the project, and his extensive knowledge of energy supply, is ideally equipped to serve in this capacity.

A graduate of Rice University, Mr. Thagard has been associated with Texas Eastern since 1947. When the company formed its department of Plans and Economic Research in 1955 to explore areas of diversification, he was promoted to direct the activities of that department. In May, 1958, when the activities of the department were expanded and reorganized as the Coordinating and Planning Department, he was named manager, the position he has held until the present time.

Prior to coming with Texas Eastern, Mr. Thagard was associated with the Ebasco Services, Inc. He began his professional career with the Atlanta Gas Light Company, Atlanta, Georgia, in 1935.



Now, all Spang CW Galvanized Steel Pipe carries this new marking which is your assurance of top-quality domestic steel pipe.

## Look for this marking when you buy steel pipe

### It spells two important advantages for you:

1. Pipe made in the United States of America must meet the high product standards set by definite technical specifications established for all pipe manufacturers. When you buy American-made steel pipe, you know you're getting a fine, standard product with good working characteristics and assured long life that will meet specified service requirements.
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turing and thoroughly tested and inspected before shipping to assure you of a top-quality product, uniform throughout, for fast, economical, trouble-free installations.

Don't take chances by making second-rate installations with questionable foreign imports. It's worth your reputation to buy Steel Pipe made in USA. It pays in the long run!

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Steel's Symbol  
of strength,  
long life,  
and economy



New "Made in USA" marking on Spang CW Galvanized Steel Pipe is applied after pipe has been quick-quenched following galvanizing.



## THE NATIONAL SUPPLY COMPANY

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Subsidiary of Armco Steel Corporation





# TIMELY COMMENTS

## Professional Responsibility

**FRANK A. Butrico**, Chief of the Engineering Resources Program of the U. S. Public Health Service, told a gathering of civil engineers that the completion of certain academic requirements does not itself entitle the engineer to *lasting professional recognition*.

"Just as the doctor and the lawyer must meet certain standards, so must the engineer. Registration is being recognized increasingly by professional and technical organizations and employers."

Mr. Butrico offered four criteria, or characteristics, of the professional man: willingness to work to advance the profession, registration, communication, and leadership in public life.

Regarding communication, he said that "most of us fall completely flat when it comes to writing technical articles, and there is too much of a tendency to 'let George do it!' But a more important shortcoming is the engineer's lack of ability to write for the lay public. If the public does not understand the message, it is not going to help us as a profession."

He also called for more engineer-statesmen who can help influence public policy. "The engineer is very actively involved in the technological advances of our modern society. In fact, the preeminence our country has throughout the world in technological advances is due in a large measure to the professional engineer. The question we want to ask ourselves, though, is how much influence does the engineer have in public policy decisions involving technical projects? How can the engineer make his views known?"

"The answer is that we must keep pace with the changing times and not set ourselves apart by working only at the professional level. Engineers — at least those with the ability for it — must consider additional training and be willing to work in managerial and administrative positions so that they can take greater part in shaping public policy."

## Tomorrow's Equipment

**IN AN ADDRESS** before the Southern Research Institute's conference on "Tomorrow's Transportation" at Birmingham, Ala., Charles C. Whittelsey, president of Ford, Bacon & Davis, Inc., foresaw the introduction of *disposable* mechanical equipment and greater use of pipe line transportation.

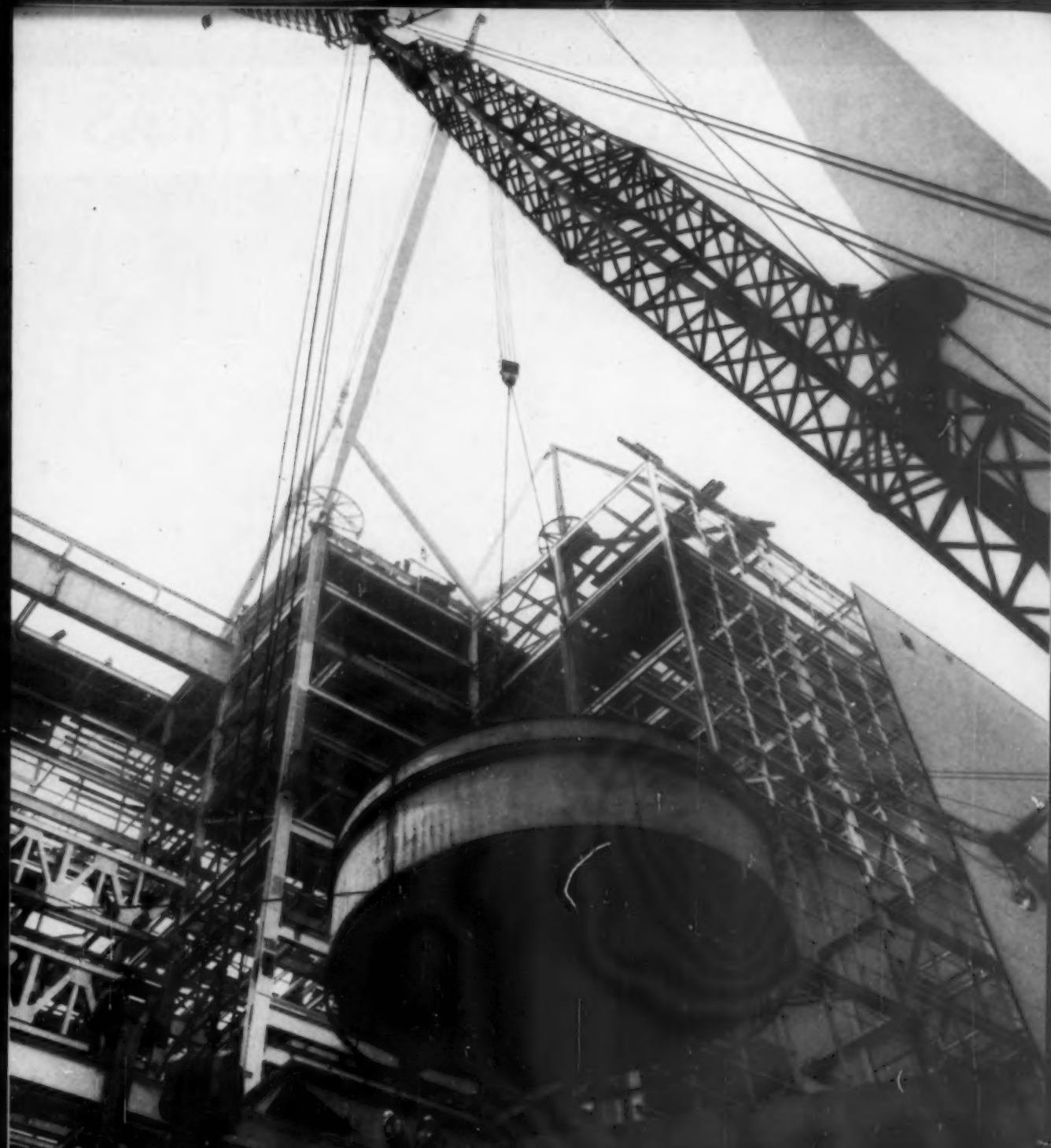
"Instead of buying a prime mover designed to last 200,000 to 300,000 hours, we will buy one to last 50,000 hours. When it wears out, we will throw it away and buy a new one, saving money in the process.

"Let's suppose that we could reduce the cost of a compressor station 30 per cent by using less rugged equipment. At the present cost of risk capital, the savings in interest alone over a period of 11 years would equal half the cost of the original station." This, he added, would permit replacing the equipment and still save the customers the extra depreciation and taxes that a more permanent installation would require.

"Some pipe lines of the future," Mr. Whittelsey continued, "will carry several products at the same time, to be separated at their destination, while others will act as great mixing vats, allowing the chemical processing to take place during transit.

"Widespread use of pipe lines for solids waits on a large and dependable demand for the product. Coal is already being carried over 100 miles by pipe line. One idea now undergoing research is the shipment of grain by pipe line. Technical difficulties have not yet been overcome, but it is a challenging problem for an imaginative engineer.

"One hundred years hence the pipe line systems stretching across vast geographical areas will be bigger, and perhaps even more imaginative, than anything we have yet seen. Here is a chance to prove the economics of pipe lines as carriers not only of gas and liquid fuels but of solid materials and multiple products."



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**OAK CREEK PLANT INSTALLS ITS 14th LJUNGSTROM®**

Three new Ljungstrom Air Preheaters are being added to the eleven already in service at Wisconsin Electric Power Company's Oak Creek plant. These three 290-ton units will serve the 1,780,000 lb/hr boiler on Oak Creek's #6 unit. The three Ljungstroms, with a total heating surface

of 795,300 sq ft, will reduce stack gas temperature from 550°F to about 270°F and preheat incoming combustion air from 190°F to about 510°F.

Our engineers will be glad to recommend how Air Preheater equipment can improve your operating results on new or existing fuel fired units.

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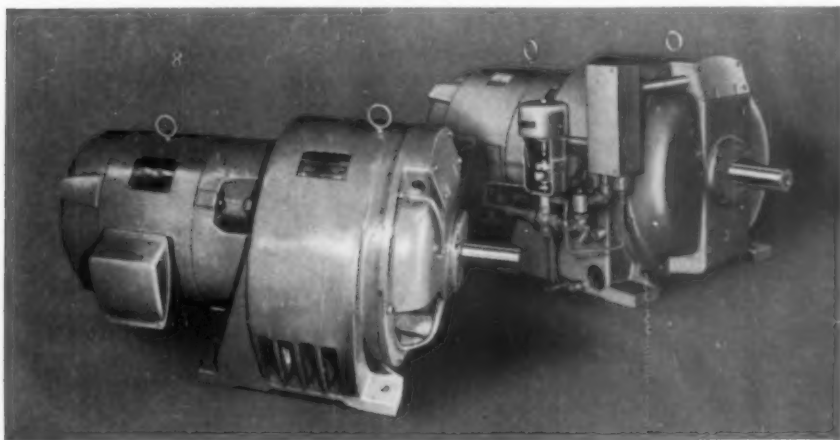
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Your Man from Westinghouse is ready now to help you apply MagnaFlow drives . . . and any other drives you may need. Call him . . . or write for a copy of Westinghouse MagnaFlow Electromagnetic Drives (B-7875), Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania. You can be sure . . . if it's Westinghouse.

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MagnaFlow drives—air cooled (foreground) and liquid cooled—are available in various horsepower ratings for winders, conveyors, fans, pumps, extruders and other machinery in all industries.

Westinghouse



# Combined Gas-Steam Cycle Performance

By J. A. CARROLL

Chief Engineer  
Rio Pecos Station  
West Texas Utilities Company



Building addition for new 33,000 kw unit.

**THE RIO PECOS** Plant of West Texas Utilities Company is located ten miles west of McCamey, Texas, on the banks of the Pecos River, at an altitude of 3,200 ft above sea level. Prior to installation of a gas turbine in 1954, the generating equipment consisted only of three 6000 kw steam turbine generators with throttle conditions of 250 psig and 175 F superheat, installed in 1926. Five boilers supply the steam to these turbines through a common header.

In 1954, a 5000 kw General Electric simple cycle, single shaft gas turbine installation was completed. It consists of a constant speed axial flow air compressor gas turbine with gas fired combustors. In this 1954 installation the gas turbine exhaust heat was recovered by using a stack cooler to heat feedwater for the five old boilers. It was located in the cycle prior to the deaerating heater (see diagram). This arrangement resulted in an improvement in the efficiency of the plant, as well as an increase in plant capability. But we were unable to utilize all the heat from the gas turbine exhaust. Consequently, it was planned for a later steam turbine installation to rectify that condition and increase capacity.

## 1959 Installation

The No. 5 steam turbine and new boiler installation was designed to operate on a gas-steam cycle

in conjunction with the existing gas turbine, leaving the old boilers and old steam turbines to serve independently as reserve capacity.

Calculations indicated that the exhaust of the gas turbine would supply the required oxygen to support combustion on the new gas fired boiler up to 33 mw. Actually, we have been able to carry loads up to 35 mw in the winter months on the steam generating plant and 4617 kw on the gas turbine. This is accomplished, operating with 13.5" water back pressure on the gas turbine in order to supply the required boiler burner box pressure without the use of a forced draft fan on the pressurized boiler. The flue gases are used to heat feedwater, since an air heater is not required. We have an economizer and stack cooler located in the exit gases.

At loads of 33 to 35 mw the gas turbine exhaust temperature is approximately 850 F. Using natural gas fuel with a heat value of 748 Btu per cu ft, the oxygen content of the gas turbine exhaust is approximately 17%. Beyond the steam turbine load of 33 to 35 mw it is necessary to supply air to supplement turbine exhaust. The fresh air is supplied by a Joy axial flow forced draft fan.

Taking into consideration that

the gas turbine was already in place, and reusing the existing recuperator as the stack cooler, and being able to use the existing cooling tower — the addition of the 33 mw steam generating capacity using the combined cycle cost somewhat less than a normal conventional cycle plant.

## New Plant Arrangement

Typical of numerous plants in the Southwest, the new plant is of the semi-outdoor type. The climatic conditions in this semi-arid location with its dust storms influenced the decision to provide a turbine room enclosure.

The central control room is on the same floor level as the turbine generator. The control room encloses the boiler control panel, turbine panel, and the switchboard. This includes the controls for both the gas turbine and steam generators along with five high-line feeders. The control room is air conditioned with a 7½ ton heat pump. Also located on this elevation are the 2300 volt and 440 volt auxiliary switchgear and transformers. The boiler burners are also at this elevation. The turbine room is equipped with a 30 ton overhead crane.

Located just outside the central control room is the kitchen provided for the operators. This in-

cludes an electric stove, refrigerator, sink and cabinet space.

The deaerating heater, forced draft fan, evaporator and distilled water storage tank are outside on a deck above the switchroom and switchgear bay.

The basement floor is at grade level to match the existing floor in the gas turbine room. Located in the basement are the two Ingersoll Rand re-entry type boiler feed pumps, with 700 hp Elliott motors, the station and control air compressors, evaporator feed pumps, sink for water sample collections, the miscellaneous drain tank and pumps, turbine oil and turbine oil storage tanks along with the Westinghouse condenser and condensate pumps. The two vertical type circulating pumps are located at the cooling tower.

The A, C, and D vertical feed-water heaters and the hogging ejector are on a mezzanine floor.

#### Operation and Control

To fully utilize the overall gain in plant efficiency, the gas turbine and steam turbine are normally operated together. The system is arranged, however, so that the steam turbine and boiler can operate independently of the gas turbine with a full sized forced draft fan. The gas turbine can also operate independently, discharging its exhaust gases through a stack to atmosphere. The plant is very flexible and reliable since it is composed of two power units capable of operating separately. There were, however, more than the usual amount of bugs to be worked out of the design and equipment on start up.

As long as there is sufficient oxygen in the gas turbine exhaust to support combustion, the combustion control system simply increases or decreases fuel gas flow as required to maintain a constant steam pressure from the boiler. This means that after we reach 33 to 35 mw on the steam turbine, the combustion control begins to demand air from the forced draft fan. The point at which this fan starts to supply air can be varied by the operator by changing the fuel air ratio setting. It is during operation at 33 to 35 mw that the fuel air ratio is used by the operator to control excess air and com-

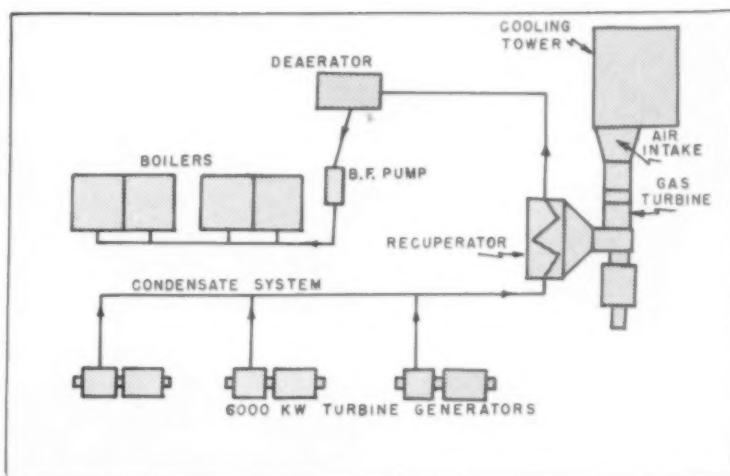
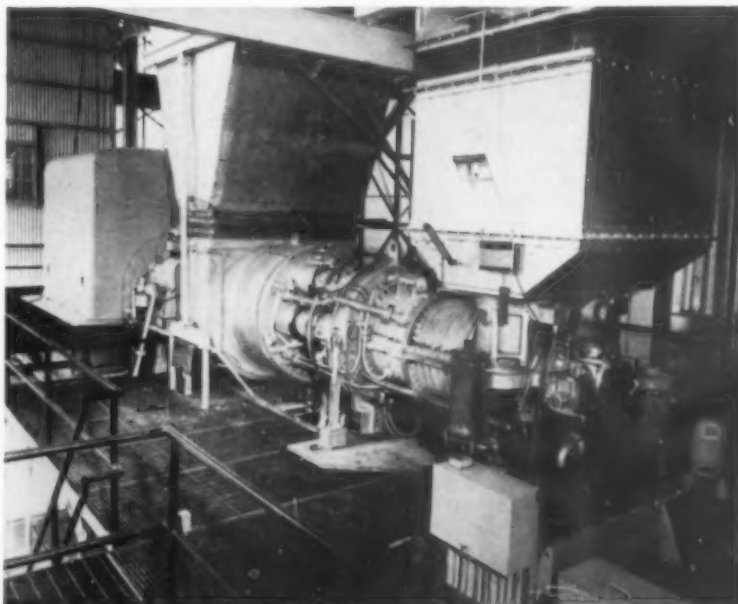


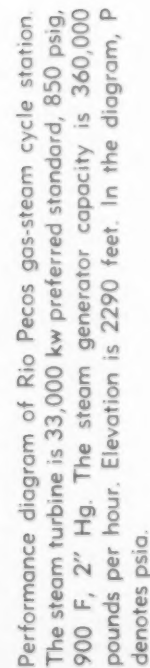
Diagram of plant in 1954, after the gas turbine was installed.



The new 33,000 kw Allis-Chalmers turbo-generator.



The 5000 kw General Electric gas turbine installed in 1954.



Gross Generator Output  
Auxiliary Power @ 2.7%  
Net Sent Out  
Operating Efficiency  
Btu/Kwh Sent Out  
Plant Thermal Efficiency

K <sub>w</sub>	44,589
K <sub>w</sub>	1,205
K <sub>w</sub>	43,384
%	100
	11,400
%	29.94

bustibles in the boiler.

For safe operation, the force draft fan is normally running all the time the steam plant is in operation. But it is removed from service for maintenance and inspection at loads below 33 to 35 mw for short periods. In normal operation below these loads the fan is running with minimum blade pitch and the damper closed between the fan and the boiler. The interlocking between the fan and damper prevent the damper from opening unless the fan is running.

Should the gas turbine oil circuit breaker trip, it closes a contact that starts a 20 second timer relay that will trip the fuel gas valves on the boiler if the damper is not open.

There are two 60" Henry Pratt butterfly dampers on the gas turbine exhaust gases, one to the stack and the other to the boiler. These are both driven by the same motor operator and are both mechanically synchronized so that one damper is opened while the other is closed.

In bringing the boiler on the line, the operator may adjust the position of these two dampers from the control room to take any necessary amount of the exhaust gases to the boiler. There is sufficient heat in the gas turbine exhaust gases to generate 3,600 pounds per hour of steam in the boiler. Should the gas turbine trip for any cause, we have a segmental orifice in the 60" induced draft duct between the gas turbine and the boiler that will actuate closing (on 2" differential) of the damper to the boiler and thereby open the damper to the stack.

#### Steam Generator

The steam generator is a Foster-Wheeler pressurized fired unit, two drum type. It is combination gas-oil fired. A conventional boiler would normally have an air heater instead of the economizer surface to lower the flue gas temperature. In the gas-steam cycle, however, the gas turbine acts as the air pre-heater and delivers the preheated air to the burners. This permitted us to use a low grade gas in the new boiler.

The gas that we are burning has

### Results of Efficiency Tests

TEST NO.	(1)	(2)	(3)
Gross Generation Steam KW	39,291	33,398	22,464
Gross Generation G.T. KW	4,650	4,511	4,436
Total Gross Generation	43,941	37,909	26,900
Station Use Steam KW	1,542	1,501	1,427
Station Use G.T. KW	8	8	11
Total Station Use	1,550	1,509	1,438
Total Net Generation	42,391	36,400	25,462
Overall Station Heat Rate Btu/nkwh	11,186	11,040	11,375

a sulphur content from 600-700 grains per 100 cu ft. The boiler is designed for normal rating of 300,000 lb per hour with a peak load of 360,000 lb per hour at 875 psig and 905 F total temperature. The steam temperature control is a Bailey Meter Company pneumatically operated, three element type.

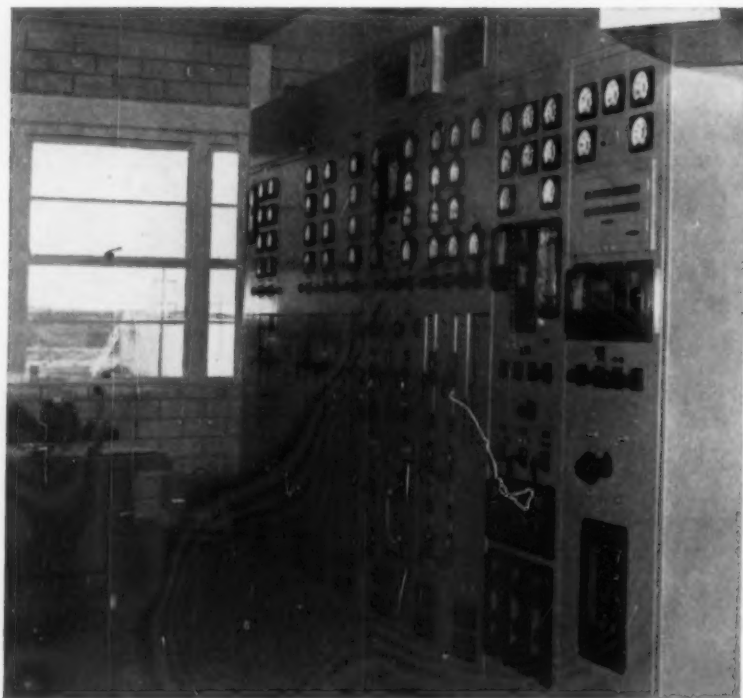
It uses final superheat temperature, spray outlet temperature and steam flow from which to control.

The feedwater regulator is a Copes-Vulcan three element type. It uses drum level, steam flow and feedwater flow from which to control.

The boiler feed pumps are In-

The new 360,000 lb/hr Foster-Wheeler pressurized boiler.





The central control room encloses boiler and turbine panels and electrical switchboard for the gas-steam cycle plant.

gersoll-Rand 4HMTB6 re-entry type. This type of pump was required because of the low design pressure of the existing recuperator, being used as a stack cooler.

This re-entry type pump is a combination booster and boiler feed pump on a single shaft.

The first impeller takes suction from the deaerator and discharges

the water out of the stack gas cooler and back through the intermediate pressure heater. The water then re-enters the pump at the second impeller and is finally discharged from the sixth impeller to the high pressure heater, then through the boiler feed regulator into the economizer and on into the boiler drum.

### Conclusion

The Rio Pecos installation of the gas-steam cycle, with the gas turbine exhaust serving as boiler combustion air is one of the first such cycles in a public utility plant. It offers a new and promising advancement in the search for higher efficiency.

The accompanying tabulation shows results of efficiency tests made by West Texas Utilities Company. It was noted, however, that the "A" heater was very dirty just prior to these tests. It has since been cleaned and this has improved our efficiency even more. For one month since the cleaning, we had a combined cycle hourly average net generation of 41,764 kw, with an exhaust pressure for the steam unit of 1.06 psia, and the average Btu per kwh net was 11,179.

## Controller for Spot Welding

**THE REDESIGN** of stainless steel and titanium assemblies used in the fabrication of certain of Lockheed Aircraft Corporation's production planes allowed the use of fusion spot welding.

With the welding of these metals came the problem of more accurate weld time and the necessity for an accurate post weld arc of sufficient heat to prevent too rapid cooling of the weld.

After much experimental work done with existing controllers, an experimental controller was produced in the research department using electronic timers which allowed the necessary accuracy. This unit was refined and redesigned in the plant engineering department into a unit containing all of the safety features and compactness necessary for production use.

The controller holds back the welding arc until after all gas lines are purged and coolant is flowing. The timing cycle is started by the arc itself through a special bridge circuit which sets the bias of a thyatron tube. The welding time and post weld time is determined by R C constants in the grid circuits of other thyatron tubes to the completion of the weld and post weld cycles.

In operation, the weld time, the post weld time, the weld heat, and the post weld heat are set on the controller. The operator pulls the welding gun trigger once to purge the lines, then again to make the weld. Each succeeding weld requires only one pull of the trigger until a complete series of spots have been made. Once the weld starts, the controller takes over to

complete the cycle.

Twenty test welds were made on titanium having an average diameter of .30 inches and subjected to shear test of 4,600 lb and pull test of 3,040 lb. Variation in holding power between spots of the same metal thickness and welding time was found to be within 10%. Tests and usage have proved this controller to be superior to any found so far on the market. Its ability to form welds on stainless steel and titanium rapidly, accurately, and with a minimum of man-hours has contributed substantially to the efficiency of the production of aircraft.

By **S. D. CHERRY**

*Electronics Engineer, Sr.  
Lockheed Aircraft Corporation  
Marietta, Georgia*

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# **THERMAL INSULATION**



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# Thermal Insulation . . .

## Reference Guide and Buyer's



### CATALOGS AND BULLETINS

Reference literature available from manufacturers to help solve thermal insulation problems and apply materials and equipment. Use Reader Service Card on Page 75.

**X-1—Foamed Plastic** — Bulletin 11-143-360, 4 pages, describes Armaflex 22, an improved flexible foamed plastic pipe insulation, for use on liquid cooling and heating lines and other applications in the processing industries. — **ARMSTRONG CORK COMPANY.**

**X-2—Industrial Insulations** — Form A-91, 20 pages, catalogs flat materials (blocks, blankets, semi-rigid); insulating and finishing cements; pipe coverings; fill materials; and protective coatings, for high and low temperatures. — **THE EAGLE-PICHER COMPANY.**

**X-3—Cellular Glass** — Bulletin F1-106 25M, 12 pages, presents data on "Foamglas" insulation for industrial piping and equipment, and "Foamsil" acid resistant insulating refractory, available in flat blocks, pipe covering, fitting covers, curved sidewall segments, and head sections. — **PITTSBURGH CORNING CORPORATION.**

**X-4—Urethane Rigid Foam** — Preliminary Data Sheet, 11 pages, gives physical characteristics for U-200, with results of a four-hour immersion test in several different chemicals, using iron pipe, copper water tubing, and vertical flat sur-

faces. — **UNION ASBESTOS & RUBBER CO.**

**X-5—Insulation Products** — A.I.A. File No. 37-D, 56 pages, contains sections on insulation for high temperature; plumbing, heating and air conditioning; refrigeration; insulating fire brick; refractory products; finishes and weather-proofing materials; asbestos paper and millboard. — **JOHNS-MANVILLE.**

**X-6—Engineered Insulation** — Bulletins form data file on industrial insulations engineered for every type of heat enclosure. Technical information, applications, and storage are discussed. Illustrated with plant photographs and line drawings. — **M. H. DETRICK COMPANY.**

**X-7—Calcium Silicate** — A.I.A. File No. 37-D-2, 6 pages, includes specifications, physical and thermal characteristics, and recommended thicknesses for calcium silicate pipe and block insulation for temperatures up to 1350 F. — **THE PHILIP CAREY MFG. COMPANY.**

**X-8—Ceramic Fiber** — "Fiberfrax" Catalog describes a ceramic fiber capable of withstanding temperatures up to 2300 F and featuring high electrical resistance, excellent

thermal and acoustical insulation, and thermal shock resistance. — **THE CARBORUNDUM COMPANY.**

**X-9—Heat Insulation** — Bulletin, 12 pages, presents photographs and applicational data on heat insulating materials, including "Stic-Tite" plastic insulations, blocks, and mineral fiber blankets, for a variety of industrial uses. — **REFRACTORY & INSULATION CORPORATION.**

**X-10—Pipe Insulation** — Bulletin IN-39 10M, 14 pages, gives specifications and data for "K&M" Zebra pipe insulation for 200 F to 1200 F, made in large half-sections to speed application. Charts show recommended thicknesses and heat transmission. — **KEASBEY & MATTISON COMPANY.**

**X-11—"Foamglas"** — A.I.A. File, 20 pages, outlines properties of building insulation for roofs, parking decks, core walls, wall linings, curtain walls, perimeters, ceilings. Plant photographs show specific applications. — **PITTSBURGH CORNING CORPORATION.**

**X-12—"Careytemp"** — Form No. 6409-10M, 4 pages, lists application and specification data on pipe

## Directory for the South-Southwest



and block insulation for temperatures up to 1600 F, composed of silica with a specially developed binder and reinforced with an inorganic fiber. — THE PHILIP CAREY MFG. COMPANY.

**X-13—Colored Insulation** — Bulletin, 6 pages, shows colors offered in "Lagstone," protective color-coding material for piping and ducts, with application by brush, spray or roller on all insulating materials. Specifications included. — BENJAMIN FOSTER COMPANY.

**X-14—Hydrous Calcium Silicate** — A.I.A. File No. 37-D-2, 20 pages, presents data on "Thermobestos" pipe and block insulation, with photographs showing use in power plants, chemical, petroleum, and paper industries. Explains advantages of hydrous calcium silicate, not damaged by water. — JOHNS-MANVILLE.

**X-15—"Fiberglas"** — Brochure, 4 pages, presents Kaylo-Klad high temperature insulation with a new embossed aluminum jacket, featuring quick one-step application to give piping full weather protection while adding a no-glare appearance. — OWENS-CORNING FIBERGLAS.

**X-16—Hot Buried Piping** — Brochure S-87-F-60 2M, 4 pages, provides an answer to all-around protection for hot buried piping, by means of "Gilsulate" insulation, which can be buried in the ground without deteriorating. Specific applications are illustrated. — AMERICAN GILSONITE COMPANY.

**X-17—Molded Calcium Silicate** — Specifications & Samples available for new "Calsilite-Hi," for soaking heat to 1800 F in both insulation and fireproofing; available in half-sectional, three segmental, and block form. — THE RUBEROID COMPANY.

**X-18—"Ultralite"** — Brochure UTV, 8 pages, tells why a heated tank is like a giant radiator, and explains how Ultralite-insulated tanks can pay for themselves by saving a large percentage of the heat previously wasted, as well as through substantial savings in maintenance. — GUSTIN-BACON MANUFACTURING COMPANY.

**X-19—Protective Coatings** — Product Information on C-13-A, an asphalt base clay emulsion for a breathing type of coating; Thermal-

kote weather resistant asphalt mastic for heavy duty over wire-held insulation; and C-19, a non-breathing, vapor sealing cutback asphalt coating — for outdoors against weather and indoors against vapor moisture. — THE FLINTKOTE COMPANY.

**X-20—Thermal Conservation—Folder**, 4 pages, covers insulation solutions for high and intermediate temperatures, heating and air conditioning, low pressure steam, and ice water and frigid temperatures. — MUNDET CORK CORPORATION.

**X-21—"Mono-Kover"** — Bulletin J-660, 4 pages, describes thermal and physical characteristics of a one-piece pipe insulation for service from below zero to 350 F, and explains easy application of the mineral fiber material. Specifications are provided. — BALDWIN-EHRET-HILL, INC.

**X-22—Duct Insulations** — A.I.A. File 37-D-2, 8 pages, covers thermal duct insulations; thermal and acoustical duct liners; accessory materials, tapes, stapler, and adhesives. Ordering and shipping information included. — GUSTIN-BACON MANUFACTURING COMPANY.

**X-23—Piping Systems** — Catalog sections cover Product, Engineering, Specifications, Drawings, Installation — for underground and overhead prefabricated insulated piping systems, designed to give ex-

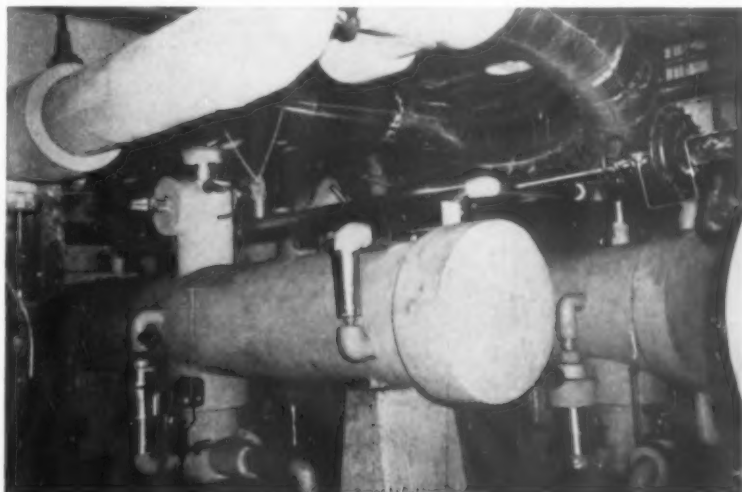
ceptionally high mechanical strength and thermal efficiency. — RIC-WIL INCORPORATED.

**X-24—Thermal Insulation** — K&M Bulletin, 8 pages, catalogs products for a variety of industrial insulation purposes at different temperatures. Illustration and description, features and advantages, properties, thermal conductivity, sizes, given in each case. — KEASBEY & MATTISON CO.

**X-25—"Superglas"** — Folder describes pipe insulation with "hinged action," manufactured in one piece and having full length sections to open easily for fast installation, suitable for temperatures up to 350 F, easy to cut and fit. — MUNDET CORK CORPORATION.

**X-26—"Fine-Fyber Felt"** — Bulletin J-661, 4 pages, presents thermal and acoustical characteristics of a lightweight insulation designed for service from sub-zero to 450 F. Plant photographs show ease of installation. — BALDWIN-EHRET-HILL, INC.

**X-27—Moisture-Vapor Barriers** — Nokorode Catalog of coatings, rust preventives, industrial mastics, gives descriptions and specifications, and plant applications are illustrated with photographs. — LION OIL COMPANY, Div. of Monsanto Chemical Co.



# Buyer's Directory

This tabulation lists many of the important thermal insulation suppliers and their representatives in the South and Southwest. Some manufacturers, however, failed to furnish information requested.

**AMERICAN GILSONITE COMPANY,** Municipal Airport, P. O. Box 15, Salt Lake City, Utah

Alabama, Birmingham 5: George K. Moss Co., 205 S. 32nd St. Phone FA 2-5812

Georgia, Atlanta 5: Applied Engineering Co., 650 Lindbergh Drive, N.E. Phone CEdar 7-7522

Louisiana, New Orleans 6: Edgar Murray Supply Co., Inc., P. O. Box 74. Phone TULane 0481

Maryland, Baltimore 15: Freemire & Associates, Inc., 2802 Ridgewood Ave. Phone MOhawk 4-5626

Missouri, Kansas City 8: Anderson-Stolz Corp., 1727 Walnut St. Phone GRand 1-2024

North Carolina, Greensboro: Applied Engineering Co., P. O. Box 2311. Phone BRoadway 5-1631

Oklahoma, Oklahoma City: Loeffler-Greene Supply Co., 1604 N.W. Fifth. Phone CEntal 5-6351

South Carolina, Orangeburg: Applied Engineering Co., P. O. Box 506. Phone JEFferson 4-2424

Tennessee, Knoxville: John M. Dooley & Associates, 1832 McCalla Ave. Phone 2-3655

Tennessee, Memphis: Hurston-Conaway, Inc., 812 S. Highland. Phone GLendale 8-4461

Texas, Dallas 7: J. R. Dowdell & Co., 3160 Irving Blvd., Box 10666. Phone FLEetwood 7-5631

Virginia, Richmond 19: Shultz & James, Inc., 9 E. Cary St. Phone MILton 4-0321

**ARMSTRONG CORK COMPANY,** W. Liberty St., Lancaster, Pa.

Florida, Jacksonville 1: R. C. Roberts, 400 W. Monroe St. Phone EL 3-8212

Georgia, Atlanta 8: R. G. Hannam, Dist. Mgr., 727 W. Peachtree St., N.E. Phone TR 5-7201

Louisiana, New Orleans 19: J. J. O'Connor, Jr., 3308 Tulane Ave. Phone HU 2-2186

Missouri, Kansas City 8: F. C. Young, Dist. Mgr., 500 W. 26th St. Phone VI 2-9155

Missouri, St. Louis 10: D. W. Kuhn, 1919 Hampton Ave. Phone MI 7-3200

North Carolina, Charlotte 3: J. H. Johnson, 1127 E. Morehead St. Phone ED 3-7741

Texas, Dallas 19: J. D. Brock, 2727 Oak Lawn Ave. Phone LA 6-7468

**BALDWIN-EHRET-HILL,** 500 Breunig Ave., Trenton 2, N. J.

Florida, Apopka: E. R. Hoff, 1435 Eden Drive. Phone TUcket 6-0821

Texas, Houston 4: K. A. Kuykendall, 4101 San Jacinto. Phone JACkson 3-7397

**THE CARBORUNDUM COMPANY,** P. O. Box 337, Niagara Falls, N. Y.

Alabama, Birmingham 9: McConnell Sales & Engrg., P. O. Box 5825, Homewood Branch. Phone TRemont 1-3501

Georgia, Chamblee: T. E. Nance, 2626 Stoland Drive. Phone MELrose 6-6184

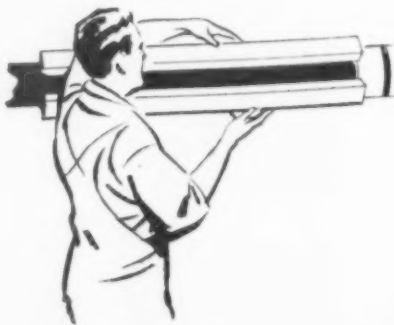
Maryland, Severna Park: J. C. Barba, 121 Arundel Beach Road. Phone Severna Park 1647

Missouri, St. Louis 1: Christy Firebrick Co., 506 Olive St. Phone GARfield 1-1603

Texas, Houston 27: C. O. Byrd, 6236 Olympia Drive. Phone HOMestead 8-0537

**PHILIP CAREY MANUFACTURING COMPANY,** 320 South Wayne Ave., Cincinnati 15, Ohio

Georgia, Chamblee: R. E. Looman, 3806 Donaldson Drive. Phone CH 7-5050



## Blocks, Boards, Sheets, Fiber, Coatings, Adhesives

Louisiana, Metairie: W. J. Noonan, 620  
Melanie Ave. Phone VE 3-0893

**M. H. DETRICK COMPANY**, 111  
W. Washington St., Chicago 2,  
Ill.

Missouri, St. Louis 10: J. B. Smith, 4233  
Chouteau Ave. Phone OLive 2-7699

Texas, Houston 25: F. M. Douglas, 2284  
W. Holcombe Blvd. Phone MADison  
3-4484

**THE EAGLE-PICHER COMPANY**,  
900 American Bldg., Cincinnati  
1, Ohio

Alabama, Mobile: Insulation Engineers,  
Inc., P. O. Box 815. Phone GR 7-0452

Florida, Winter Haven: George L. Simonds  
Co., Fifth St., S.W.

Georgia, Decatur: Walter F. Rock, Area  
Mgr., 2077 Green Forest Drive. Phone  
BU 9-3783

Louisiana, Shreveport: The Aber Co., Inc.,  
2632 Levy St. Phone 8-3526

North Carolina, Charlotte 1: Guy M. Beaty  
& Co., 522 S. Elliott St. Phone ED 3-8625

Tennessee, Chattanooga: Guy M. Beaty &  
Co., 1106 Carter St. Phone 6-2304

Tennessee, Nashville: Boiler Supply Com-  
pany, Inc., 490 Craighead St.

Texas, Amarillo: Clowe & Cowan, Inc., 223  
W. Fourth St.

Texas, El Paso: Geo. S. Thomson Co., Inc.,  
611 N. Campbell St. Phone KE 3-9503

Texas, Houston 35: J. P. Kelley, Area  
Mgr., 5331 Carew St. Phone MOhawk  
7-8716

Texas, Houston 21: Precision Insulation  
Co., Inc., 2931 Holmes Road. Phone JA  
6-3591

Texas, Odessa: Western Chemical & Supply  
Co.

Texas, Orange: Sabine Insulation Co., Inc.,  
1111 Polk St. Phone TU 3-8486

**THE FLINTKOTE COMPANY**, 30  
Rockefeller Plaza, New York,  
N. Y.

Louisiana, New Orleans: C. M. Abadie,  
1221 Carondelet Bldg. Phone 524-8733

**BENJAMIN FOSTER COMPANY**,  
4635 W. Girard Ave., Philadel-  
phia 31, Pa.

Georgia, Atlanta 5: William J. Barsh, 3230  
Peachtree Rd., N.E. Phone CEdar 3-7590

Tennessee, Mt. Juliet: James F. Munson,  
Route 2. Phone 1534-W

Texas, Houston 24: Harvey Lee, Jr., 79  
Patti Lynn Lane. Phone CApitol 5-1357

Virginia, Richmond 24: Sheppard C. Bell,  
6107 Barlen Drive. Phone MILton 9-2092

**GUSTIN-BACON MANUFAC-  
TURING COMPANY**, 210 West  
10th St., Kansas City 5, Mo.

Alabama, Birmingham: J. R. Smith, 1288-A  
49th Place South. Phone LYric 2-3463

Florida, Jacksonville: F. M. Quattlebaum,  
1449 Live Oak Lane. Phone FLanders  
9-1280

Florida, Miami Springs: R. L. Macy, P. O.  
Box 556. Phone TUxedo 5-1282

Georgia, Atlanta: C. W. Goode, Dist. Mgr.,  
Rm. 512, 1430 W. Peachtree St., N.W.  
Phone TRinity 5-8657

Louisiana, New Orleans: R. C. Ebbert,  
6105 Colbert St., Box 12005. Phone  
AUDubon 2-335

North Carolina, Charlotte: P. D. Petris,  
519 East Trade St. Phone EDison 3-0453

Texas, Dallas 35: J. L. Mohun, Rm. 803,  
100 Exchange Park, North. Phone FLee-  
wood 2-8107

Texas, Houston: P. O. Craig, Dist. Mgr.,  
5531 Armour Drive, P. O. Box 4555.  
Phone WALnut 6-2671

Texas, Lubbock: R. A. Snyder, 4216-A  
36th St. Phone SWift 9-4816

**JOHNS-MANVILLE**, 22 East 40th  
St., New York 16, N. Y.

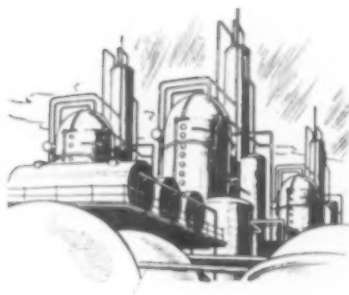
Georgia, Atlanta 3: Johns-Manville, 101  
Marietta St. Phone JACKson 5-2021

Missouri, St. Louis 5: Johns-Manville, 7912  
Bonhomme Ave. Phone PARKview 1-4000

Texas, Houston 4: Johns-Manville, 3115  
Blodgett St. Phone JACKson 6-1751

**KEASBEY & MATTISON COM-  
PANY**, Ambler, Pa.

Georgia, Atlanta: Keasbey & Mattison Co.,  
134 N. Peachtree St., N.W. Phone JACK-  
son 1-1131



North Carolina, Charlotte 9: J. P. Ruby,  
241 Poindexter Dr. Phone JACKson  
3-6558

Tennessee, Knoxville 18: C. E. Webb, 5604  
Dogwood Road. Phone MUTual 7-2008

Texas, Houston: Keasbey & Mattison Co.,  
Texas Gas Bldg., 2472 Bolsover Rd.  
Phone JACKson 6-3851

**LION OIL COMPANY**, Lion Oil  
Bldg., El Dorado, Ark.

Arkansas, El Dorado: N. P. Hudson, Lion  
Oil Bldg.

Georgia, Decatur: Richard L. Hager, D-2,  
2477 North Decatur Rd.

Texas, Houston 18: John W. Walker, 5401  
Verdome Lane

**PITTSBURGH CORNING COR-  
PORATION**, One Gateway Cen-  
ter, Pittsburgh 22, Pa.

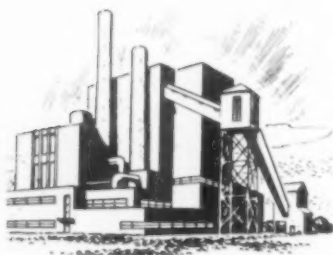
Florida, Fort Lauderdale: J. R. Vivian,  
P. O. Box 8992. Phone JACKson 2-8585

Georgia, Atlanta 9: John F. Finn, 1106 W.  
Peachtree St., N.W. Phone TRinity 2-4402

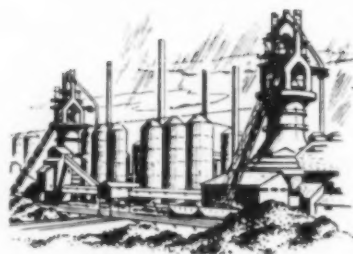
Louisiana, New Orleans 25: Harry C. Gra-  
ham, 3129 Jefferson Ave. Phone UNiver-  
sity 6-1796

Missouri, St. Louis 35: C. A. DiSilvestro,  
404 Emmet Ave. Phone JACKson 2-0304





**CATALOGS AND BULLETINS**  
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to solve  
thermal insulation problems  
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See Page 75



North Carolina, Charlotte 1: C. A. Golladay, P. O. Box 96. Phone EDison 3-5094  
Texas, Dallas 28: R. J. Farquharson, 11010 Delford Circle. Phone BRoadway 9-5440  
Texas, Houston 2: H. E. Porter, 1607 Jefferson Ave. Phone CAPitol 7-1619

**REFRACTORY & INSULATION CORPORATION, 120 Wall St., New York 5, N. Y.**

Alabama, Birmingham: W. E. Veenschoten, 2115 Eighth Ave. S. Phone ALpine 1-3567  
Florida, Miami: Voyce-Legier, Inc., First Nat'l Bank Bldg. Phone FRanklin 7-2561  
Georgia, Savannah: J. D. Robinson Co., 13-15 Bay St. West. Phone ADams 2-8811  
Missouri, St. Louis: Harry D. Roach, 12417 Gravois Road. Phone VICTor 3-3699  
West Virginia, Charleston: Allied Services, Inc., 160 Spring St. Phone DICKens 6-0494

**RIC-WIL INCORPORATED, 24 Brown St., Barberton, Ohio**

Alabama, Birmingham: Haydn-Myer Co., Inc., 1107 Seventh Ave. S. Phone FA 2-5645  
Florida, Miami: J. F. Spears Co., 2001 S.W. First St. Phone FR 3-0765  
Florida, Orlando: G. R. Macnamara, Jr., 216-217 Church & Main Bldg. Phone GA 2-3422

Georgia, Atlanta: H. Clay Moore & Assoc., 806 Henry Grady Bldg. Phone JACKson 1-1183

Kentucky, Pee-wee Valley: Clarke Kaye & Co. Phone CH 1-4436

Louisiana, New Orleans: W. H. Grant, Jr., 209 Vincent Bldg. Phone JA 5-1159

Maryland, Baltimore: A.M.K. Kroft, 508 Tower Bldg. Phone PL 2-1559

New Mexico, Albuquerque: Boyd Eng. Co., Inc., 112 W. Granite St. Phone CH 3-2247

North Carolina, Raleigh: J. T. Still Co., Inc., 620 W. Jones St. Phone VA 8-3281

South Carolina, Greenville: J. Mac. Rabb Co., 10 Pine Forest Drive. Phone CE 2-1303

Tennessee, Chattanooga: Dwight L. McNulty, P. O. Box 1066. Phone AM 7-4125

Tennessee, Memphis: T. J. O'Brien Eng. Co., 668 S. Main St. Phone JA 6-0339

Tennessee, Nashville: Boiler Supply Co., Inc., 490 Craighead St. Phone CY 7-3504

Texas, Dallas: Nathan Co., P. O. Box 7447. Phone FL 1-4307

Texas, Houston: Texas Eng. Co., 1309 Anita St. Phone JA 3-7431

Texas, San Antonio: R. S. Ryden & Co., 109 Barrera St. Phone CA 6-7229

Virginia, Alexandria: Ric-wil, Inc., 128 N. Pitt St. Phone OV 3-1800

Virginia, Richmond: L. A. Bernert, 300 E. Main St. Phone MI 3-0167

West Virginia, Charleston 3: Mechanical Products Co., 411½ D St., Room 7

**THE RUBEROID CO., 500 Fifth Ave., New York 36, N. Y.**

Georgia, Decatur: J. D. Mallard, 541 McKoy St. Phone 378-7112

Texas, Houston 17: Walter Voigt, 4025 Gulf St. Phone MISSon 9-7152

**UNION ASBESTOS & RUBBER COMPANY, 1111 W. Perry St., Bloomington, Ill.**

Florida, Miami 38: Industrial Insulators, Inc., 255 N.E. 69th. Phone PL 4-0693

Louisiana, Baton Rouge: Aber Company, P. O. Box 130. Phone ELgin 5-7731

Louisiana, Metairie: S. S. Gorin, 1208 Melody Drive. Phone VERNon 5-6368

Louisiana, New Orleans: Gabler Insulations, 1330 Tchoupitoulas. Phone JACKson 5-1136

Louisiana, Shreveport: Aber Company, P. O. Box 212. Phone 8-3526

Texas, Houston: Aber Company, 3480 West 12th. Phone UNDERwood 9-4301

**WESTERN FELT WORKS, 4115 Ogden Ave., Chicago 24, Ill.**

Florida, Fort Lauderdale: Clyde E. Craig, 2413 S.W. 34th Ave. Phone LUDlow 3-6831

Kentucky, Louisville 7: C. R. Simpson, Room 205, Wallace Center, Phone TWInbrook 5-6545

Extra complimentary copies of this Annual Thermal Insulation Directory are available. Write the Editors or use your Reader Service Post Card on page 75

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# How Your Plant Can Profit From Preventive Electrical Maintenance

**PREVENTIVE** maintenance can be described by several analogies, such as:

Specializing in avoiding calamity — rather than picking up the pieces.

A scheduled program of parts replacement and/or overhaul to prevent service failure.

A periodic "feeling the pulse" of equipment to detect symptoms and prescribe treatment before sickness sets in.

An organized evaluation of equipment condition plus the application of corrective measures on a scheduled basis.

## Needs and Aims

During the negotiation for and purchase of plant equipment, valuation of such equipment is related to the cost of manufacture and is interpreted in terms of the price it would bring on the open market. Once this equipment is installed and placed into production, however, the terms of value shift to an entirely different area. Its value is then interpreted in terms of the product dollars it is capable of producing.

Unscheduled stoppage of production equipment can very quickly be disastrous. "Bottlenecks" quickly develop in line production and seriously affect overall plant output. This is particularly true where the flow of production has been carefully engineered to require operation of all equipment at near capacity levels. An organized preventive maintenance approach with planned outages arranged to avoid disruption of the production schedule can do much to replace unscheduled stoppages.

A good maintenance program will preserve equipment and accomplish real economies in equipment dollars. Intelligent replacement of parts as needed can prevent ultimate failure of these particular parts, and preclude the

By **F. K. SHEALY**

Engineering & Service Manager  
Birmingham, Alabama Office  
Westinghouse Electric Corporation

Improved appearance, prolonged life, and reliability of equipment operation are all highly desirable results of a proper program of Preventive Maintenance.

However, in the last analysis, the primary and paramount consideration of such a program is securing the maximum in quantity and quality of production of the finished product — in short, realizing the maximum product return on each dollar of overall investment.

It is this consideration that promoted a textile executive to assert at a maintenance meeting last year, "We are irrevocably committed to such a program."

spread of difficulty to associated components.

It is common knowledge that unchecked deterioration of parts of a piece of apparatus can seriously affect the overall system — even to the extent of complete collapse. An effective maintenance approach can check such progressive deterioration and thereby preserve the life of the equipment and protect the investment represented thereby.

A sound program of equipment adjustment along with intelligent component maintenance will assure top performance as concerns quantity of production and quality of production — both of which are inseparably important.

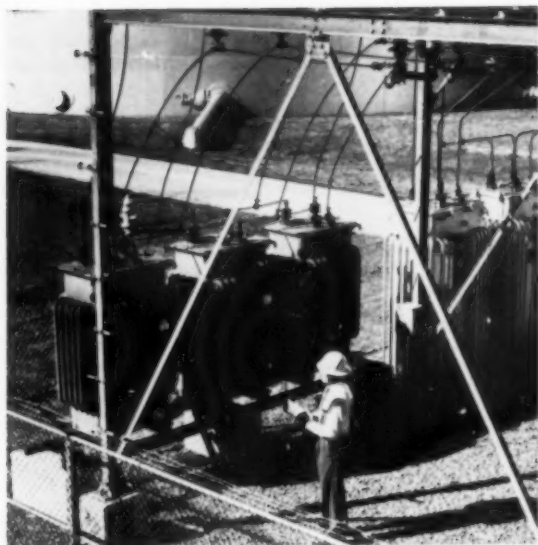
A machine that can maintain a higher rate of quality production is obviously worth more in terms of product dollars than a machine whose maladjustment limits pro-

duction to a lower value. Likewise, a machine properly adjusted to give a top quality product can deliver a far greater return on investment than a unit which is inadequately maintained and consequently produces an inferior product.

## Competition

In a business where competition is keen (and that is the usual situation) the caliber of preventive maintenance employed can directly affect competitive position. The cost of personnel and spare parts required by a thorough preventive maintenance program can rapidly become insignificant when compared with loss of production resulting from unscheduled breakdowns.

Consequently, the plant which tries to conserve this limited amount of maintenance expendi-



These photographs show a Westinghouse field service engineer (Roy Love) inspecting, testing and adjusting electrical equipment in one of the St. Petersburg, Florida, pumping stations.

ture at the probable cost of periodic disruption of production can very quickly find itself in extreme competitive difficulty with other plants which have recognized and adopted the modern maintenance approach.

### Organization

Preventive maintenance — or lack of it — not only influences the equipment and the product, but the plant organization itself. Emergencies have a way of spreading quickly from a localized area on through an entire plant. Executives responsible for production may have more than normal difficulty in maintaining composure under circumstances where production dollars are going down the drain.

An efficient preventive maintenance program can do much to eliminate such occurrences, and a

well-trained and informed maintenance crew backed by an adequate inventory of spare parts can minimize any outage that may occur. Such action can go a long way in preventing organizational upset.

Time was when maintenance of equipment was poorly understood and the caliber of performance was more or less a mystery. Trade magazines now carry many articles which can help plant management interpret the real assets of planned maintenance and inaugurate an adequate program. Time has proven that such programs pay off in increased income.

Maintenance and operating people are particularly open to the gaze of plant management, and their performance is being compared with and judged by results achieved at other locations. Adoption of sound maintenance prac-

tices, therefore, directly fits into job security.

Management of course has an increasing responsibility to recognize the need of the maintenance organization and make available the necessary funds to initiate an appropriate program of maintenance and to support its proper continuation.

### Program Prerequisites

In order for any maintenance program to function properly, it is essential that the responsible personnel *know their equipment*. This fact assumes more pronounced importance as the complexity of equipment increases.

Not only is an understanding of individual components necessary, but the interrelations of the various parts to accomplish an overall function must be known. It is essential to have a thorough understanding of the capability of a system, as concerns both speed and quality of production, in order that realistic optimum adjustment and performance can be recognized.

Another prerequisite is close observation and comprehensive testing procedures. In short, one must

diagnose completely and correctly. Much precious time has been lost and equipment damaged by hastily embarking upon a program based on a partial analysis, erroneous test procedures, or improperly interpreted test results.

Under all circumstances — regardless of the severity of emergency — an *organized approach must be used*. Both the investigative action and the corrective program must be handled in a logical manner, starting at some bench mark point and then progressing in an organized step-by-step fashion.

Not only must the work be accomplished in this manner, but

notes and tabulation of test results must be carefully recorded so that a clear picture of the proceedings is available at all times. Otherwise, repetition, loss of direction and chaos result.

#### Road to Success

The road to success can be identified very briefly in the following manner.

It must be realized that there is no best program for all situations. The best program for a particular situation must be *tailored to local conditions*.

The program must be progressively developed on the basis of accumulated experience. The im-

portant thing is to get the program started on a sound basis, using the best information available as a guide. Then review the results of the program periodically. And finally, modify the program to eliminate obvious deficiencies and to accentuate observed successes.

Once a sound commitment has been made, **MAKE THE PLAN WORK!** It has been established that the philosophy of preventive maintenance is sound. Many preventive maintenance programs at numerous locations have met with notable success. But sound planning and able management are necessary to assure success of each preventive maintenance program.

## No More Hunting and Tugging

**THE PROBLEM** of storing and handling various sizes and grades of sheet stock has been solved by The Martin Company, Orlando, Florida, by designing a tray and rack system which is serviced by a Raymond "4D" (Four Directional) Electric Truck.

Prior to installing the new system, sheet stock was piled about 7 feet high without regard to classification of material. To protect

the sheets, they were kept in the original shipping crates which had to be opened and closed as material was partially used. In spite of this precaution damage to sheets ran high.

Selecting correct stock for use was very difficult and inventory control required a triple check system to be sure proper stocks were maintained.

Because piles were limited to

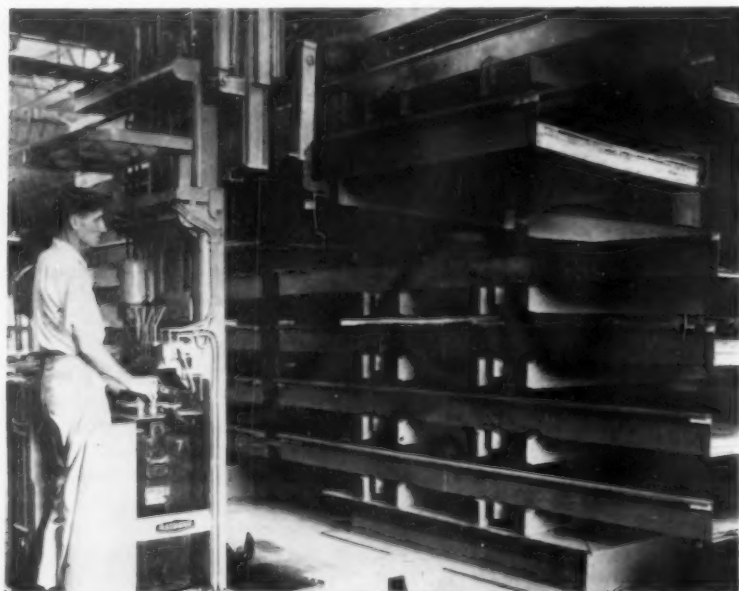
the 7 foot height, much cubage was wasted. The sheet stock storage required 10,762 square feet of floor space.

The rack and tray system served by the high-stacking, four-directional Raymond truck now allows all the stock to be stored in less than 7,000 square feet of space. Selectivity is now rated at 100% since each different item of stock is stored in its own tray which can be picked out of the rack by the fork lift truck.

Narrow 7½ ft wide aisles in the storage area were made possible by the unique 4-way movement of the truck. Material to be stored is uncrated outside of the storage area and placed in a steel tray which is carried down a wide aisle to the storage area. When the truck operator gets to the storage area he changes the position of the wheels for sideways movement and the truck with its load squeezes into the narrow storage aisle.

A "Reach Fork" mechanism then places the loaded tray in the rack.

Each rack is labeled for instant identification. Inventory control is so simple that the former elaborate record system has been eliminated. Uncrating is now a one-time operation. Manpower has been reduced by half. Housekeeping is greatly improved and the area has been made safer for workers. Damages to sheets has been practically eliminated. The new system will pay its cost in actual savings in 3 years.



# MANAGEMENT CLINIC

Conducted by ROBERT H. EMERICK, North Charleston, S. C.



## How to Prepare a Grievance Case

### Question . . . . .

**ARE THERE ANY** general rules that should be observed by the Company and the Union in preparing a grievance case for arbitration?

### Suggestions . . . . .

**WE DON'T KNOW** of any published canons on this subject. However a list of things to do, and things not to do, can be compiled as the result of experience. Here are some of them:

1. Be sure that all steps for the settlement of grievances, as prescribed in the Company-Union Agreement, have been followed without success, prior to sending the dispute to arbitration. The reason for being careful on this item, is that Arbitrators of record have refused to adjudicate disputes in which the agreed on procedures have not been observed by either or both of the parties.
2. Be sure that the document which constitutes the "Submission to Arbitration" and carries the signatures of both parties, states the issue as understood by the parties, and is worded to their common satisfaction. Arbitrators have no authority to make decisions beyond the limits of the dispute as described in the Submission Agreement. Modifications to the issue may be made before the Arbitrator, provided both parties agree to the modification, and place their signatures upon it; however this is not recommended unless the change is minor or auxiliary to the main issue. A major change at this time might be able, potentially, to upset the prepared presentation of one or both of the parties.
3. The Complainant, who presents his case first in an arbitration hearing, is advised to submit to the Arbitrator a written opening statement making clear what he expects to prove by means of evidence, exhibits and testimony, during the course of the hearing. Such a statement speeds up the proceedings, and helps the Arbitrator keep the business on the right track. This statement should be brief and pointed.
4. Each party should have its evidence and exhibits arranged in numerical sequence, to be submitted to the Arbitrator at the appropriate time. A list of witnesses, with their official positions or titles indicated, should be prepared and given to the Arbitrator at the start of the hearing.
5. Each party should present its case through a single individual. This individual, acting as spokesman for his side, calls his witnesses, and cross-examines the witnesses for the opposition. We might note that certain Unions have set up and operate a school, in which potential arbitration participants are taught the fine points of preparing and then presenting a case. Obviously this choice of an arbitration spokesman is important and merits thought.
6. Do not base any part of a case on hearsay. While the legal rules of evidence presentation are not necessarily observed in an arbitration hearing, most Arbitrators will reject any form of hearsay that is presented in support of a point.
7. And finally, do not plan to present more than one case at a single arbitration sitting, unless the Arbitrator has been notified ahead of time that more than one case is to be handled and has agreed to the projected additions. Some Arbitrators refuse to handle more than one case a day, others will accept up to three, if they are individually short and simple.



The complete lumber preservative installation at Vesta Lumber & Supply Co. From left to right, the condensate return system and automatic package boiler, the chemical storage tank, and the retort with its door swung open receiving a lumber charge. The "Continental" boiler was manufactured by Boiler Engineering & Supply Co., Inc., and the chemical tank and retort were manufactured by J. J. Finnigan Co., Inc.

## Steam for Vacuum and Pressure

**CONSIDERABLE** progress has been made in the fortification of lumber to withstand ravages of weather and plant and animal life attacks. One of the most successful ways of preserving and protecting wood used in the construction industry is through the impregnation of the wood with chemical preservatives. This is accomplished usually through steaming in a closed vessel followed by a vacuum and the admission of a salt solution.

A new installation of this type is the Osmose wood preserving process equipment installed by the Vesta Lumber and Supply Company in Niceville, north of Fort Walton Beach, Florida. Along with supplying treated material from stock, the company also offers a custom treating service, according to H. H. Carnathan, President.

The wood is processed in a retort as a batch charge for a 4 or 8 hour cycle depending on size and moisture content. Steam is generated at 125 psi by a 40 horsepower Continental automatic "package" boiler burning either gas or light #2 oil. The processing equipment consists of a mixing tank, chemical storage system, vacuum and pres-

sure pumps, the retort, pipes, valves and necessary instruments.

Steam demand, of course, is greatest during the initial heating when maximum steam is consumed in bringing the lumber load up to steam temperature of 259 F.

### Boiler Plant

The Continental automatic "package" boiler is a compact 2-pass firetube boiler ideally suited to the space-saving characteristics of an integrated unit plant operation of this type.

Electronic programming and monitoring controls reduce boiler operator attention, permitting the operator to perform other duties in addition to boiler supervision. Automatic protective safeguards assure safety.

The burner system shuts down automatically due to low water level, lack of combustion air from forced draft system, or any malfunction of the burner or fuel supply. The blower provides pre-purge before startup and post-purge after shutdown to insure evacuation of fuel traces in the combustion space. Ignition is established and proved by the con-

trol system before the main fuel supply is admitted to the burner.

The simplified 2-pass flow of flue gases permits easy and frequent inspection of fireside surfaces. Complex special refractory shapes are not needed — thus eliminating costly refractory maintenance. The 2-pass construction of the boiler results in front-end stack location with stack thermometer at eye level so that all instruments and controls are within easy observation from a single point.

Pressurized furnace operation facilitates complete control of combustion at all times and helps maintain cleanliness of all heat exchange surfaces. Efficiencies exceeding 80% are possible throughout the service life of the boiler with only routine inspection and cleaning.

### Processing Operation

In the processing operation, the preliminary steaming heats and conditions the wood. It is of special importance where the wood charge is green, especially in the case of pine. The heating aids in sap removal and has further benefits

such as sterilization. For dry lumber with less than 20% moisture content, steam is not normally required.

Steam from the boiler enters the retort through perforated holes in the steam distribution piping. The pressure control valve is a pilot diaphragm which throttles the steam entering the retort.

Steam pressure in the retort is controlled at about 20 lb per square inch. From one to two hours is required to heat the retort to the desired temperature and ordinarily this temperature is held from one to two hours more to insure thorough conditioning of the wood.

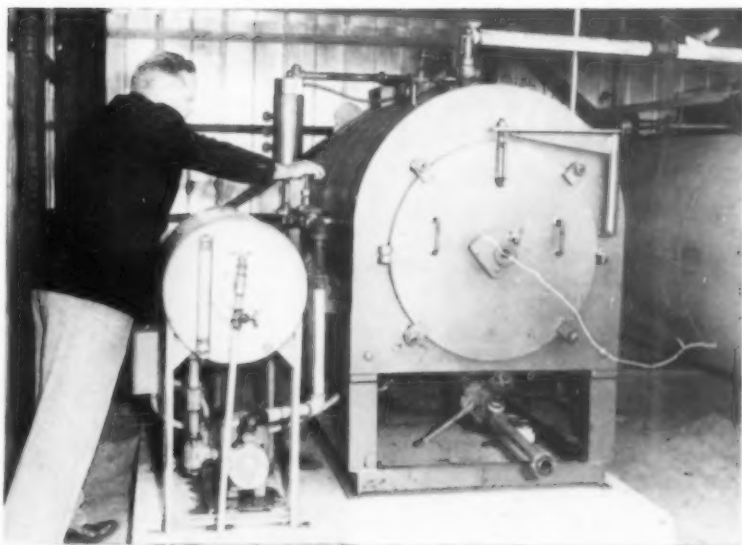
Variables that affect the time cycle include outside temperatures, wind, rain, and the degree of seasoning of the wood. The size, shape, initial temperature and moisture content of the charge also have a definite bearing on the steaming time.

The second phase of the retort operation is the vacuum period. A steam jet vacuum pump using high pressure steam through a fluted throat draws vapor from the retort and ejects it into the atmosphere. A vacuum of 20 to 25 inches is drawn. Time required for drawing amounts to about  $\frac{3}{4}$  to 1½ hours.

The third phase is the pressure period. After the vacuum, the preservative is transferred from the storage tank into the retort while the vacuum is still in effect. Then pressure is applied by the transfer pump at about 20 psi pressure until the wood will no longer absorb under these conditions. The transfer pump is then cut off and another pump is used to build up pressure to about 125 psi to impregnate the wood with the preservative to predetermined retentions. A complete cycle takes about 4 to 8 hours.

#### Solution Components

The various ingredients in preservative Osmosalts are organic and inorganic fungicides and pesticides selected to gain both deep and shallow penetration into the structure of the wood. Sodium fluoride, for instance, is an excellent fungicide. It is water-soluble and a very mobile preserving agent protecting effectively against the lyctus or powder-post beetle.



H. H. Carnathan, President of Vesta Lumber & Supply Co., checks the water level of his Continental automatic package boiler which furnishes steam to the processing operation.

The control panel programs the lumber processing operation and provides indicated and recorded data on the progress of each batch.

Another component, dinitrophenol, is an extremely toxic organic preservative agent of low water-solubility and low mobility. It aids in preventing the outward leaching of the other agents.

Other components include disodium hydrogen arsenate, a toxic inorganic agent of moderate solubility and great mobility, which protects also against both fungus and insects, particularly termites. Potassium (or sodium) dichromate is used as a fixative. It insures the retention of the other salts and gives added protection against leaching that is highly desirable in wet places.

The processing is normally specified to provide the retention of these protective salts on the basis of a certain poundage per cubic foot of wood. Retention of dry salts is stated as 0.35 lb per cu ft of wood for moderate service conditions including exposure to weather but not in constant contact with ground or water. Usually 0.55 lb per cu ft is required for severe service conditions such as constant contact with the ground or water.

Mr. Carnathan has indicated that considerable interest has been



generated in the treated lumber among Vesta customers including the building industry, industrial trade, retail lumber dealers, and farm suppliers. Many architects are now specifying the use of pressure treated lumber in order to prolong the life of wood in service and assure client satisfaction.

## AIR - COOLED TURBINE GENERATORS

By L. M. DOMERATZKY  
and J. M. LYONS

Generator Engineering Subsection,  
General Electric Company

### THE PAST TEN YEARS has

brought not only the amazing development of big hydrogen-cooled units for electric utilities, but also a quiet and less publicized revolution in the design and construction of medium sized, air cooled units for general industrial and utility applications. Air cooled turbine generators, in their size range, are now essentially equal to their more highly publicized big brothers in performance, reliability, and appearance.

As seen in Fig. 1, the air cooler consists of four sections mounted in the corners of the stator. This arrangement provides such thorough mixing of the air that it is permissible to carry 80 per cent of rated kva with one section out of service. Water connections are conveniently located below floor and the section can easily be removed by a crane for occasional repair, if necessary.

The exciter is separately ventilated by its own shaft-mounted fan. Because the ventilation circuits are separated, there is practically no chance of carbon dust getting into the generator.

The double-frequency vibration which is inherent in all two-pole generators is isolated from the foundation in one of two ways. The larger generators, starting at about the 9375 kva rating, have internal spring bars similar to those on hydrogen-cooled generators. These spring bars support the stator core within the stator frame, as shown in Fig. 2. On the smaller generators, the core is rigidly supported inside the frame, but Bel-

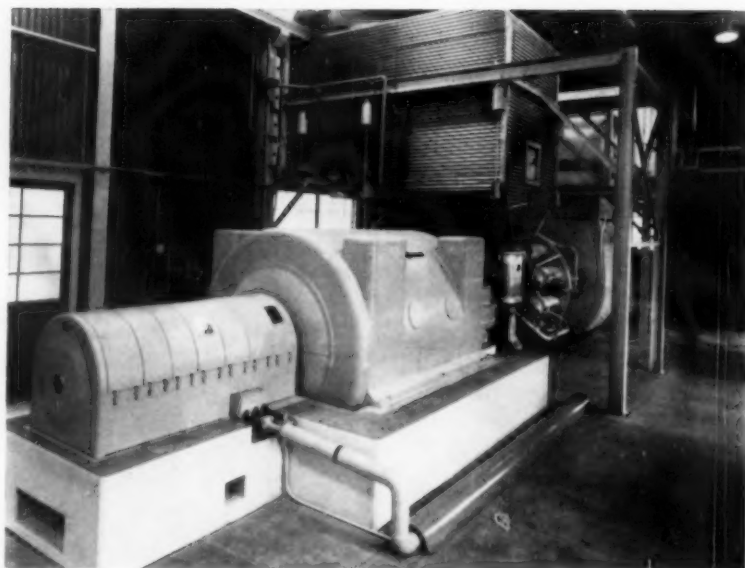


Fig. 1. Modern air cooled turbine generator

leville spring washers are often used beneath the feet to keep the foundation vibration at a very low level.

So-called "preferred orientation" strip steel was first applied to rotating electrical machinery in the stator core of a 9375 kva, 3600 rpm generator, built by the General Electric Company in 1947. Since that time the benefits of this material have become universally recognized, and it is used today in the cores of all General Electric two-pole and four-pole turbine generators where generator efficiency is of prime importance.

At comparable magnetic densities, reductions in core losses averaging 25-30% are possible with this steel, resulting in gains of  $\frac{1}{4}$  to  $\frac{3}{8}$  per cent in generator efficiency at full load, with greater relative gains at part loads. Equally important, the combination of better magnetic permeability and lower specific loss of this steel permits the use of higher magnetic flux densities with consequent reductions in size and weight of standard generators.

Heavy stacking pressures are used in the factory to assure tight cores. This pressure is maintained on the core by strong ductile cast iron flanges which are held in place by heavy nuts on the end of each keybar as shown in Fig. 4. These nuts can be retightened should the core relax after a period of service, although experience has shown that retightening is rarely necessary.

Heating of the stator end structure during underexcited operation is controlled by use of non-magnetic materials (clamping fingers and rotor retaining rings), by stepping back the end packets of punchings to reduce leakage flux at the core ends, and by the use of two new materials, ductile cast iron, and fiberglass.

Ductile cast iron is used for the stator flanges because this material, while magnetic, has relatively high resistivity to limit eddy currents, and very good heat conductivity to eliminate local hot spots.

The other new material, fiberglass, is used for the armature

coil support bands because it is not only non-magnetic but non-conducting as well, so there are no eddy currents induced in the bands.

Stator windings are Class B insulated throughout in all ratings. Great improvements have been made in the insulation of the end windings and supporting structure, which were somewhat vulnerable on older air cooled generators. For example, the fiberglass bands mentioned above give greatly increased resistance to creepage between phases and from winding to ground.

Rotor forgings receive the same attention as the ones used on the largest hydrogen-generators.

Tight sealing of the ventilation system has made possible the so-called open-end rotor winding construction shown in Fig. 5. This construction has largely eliminated the unpredictable hot spots found in previous constructions where the coil ends were wrapped with heavy insulation. Also, continued improvements in design methods and manufacturing techniques have resulted in field winding temperatures generally being kept safely below allowable limits.

Numerous minor improvements have been made in the collector assembly. One of the best examples is the use of spiral grooving in the ring surface, which has been found to significantly improve the equality of current distribution

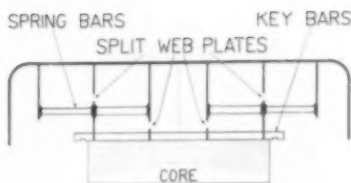


Fig. 2. Internal spring mounting of stator core

among the brushes.

The brush rigging has been completely redesigned into a more rugged assembly with greatly improved performance. Flash barriers are furnished on all riggings to help prevent accidental shorting of the field when changing brushes. Brush pigtails are now held in a quick-disconnect clip so that no tools are required for changing brushes.

A very recent change was the adoption of constant pressure brushholders. Previous brushholders utilized a helical spring on top of the brush, which had to be repositioned from time to time to keep proper pressure on the brush as it wore down. Although this was a simple operation, it was often neglected, with the result that brush pressures became uneven, and some of the brushes hogged the current. Worse yet, the pressure on all brushes sometimes dropped so low that flashovers occurred between rings.

The new constant pressure



Fig. 3. Constant pressure brushholder for collector rings

brushholder, Fig. 3, has a coiled spring which keeps constant pressure on the brush as it wears down.

Because today's air cooled generator is smaller and lighter than previous models, reactances have gone up and short circuit ratio has come down. These performance quantities are now more nearly equal to those found on hydrogen cooled generators.

Fig. 4. Stator core construction

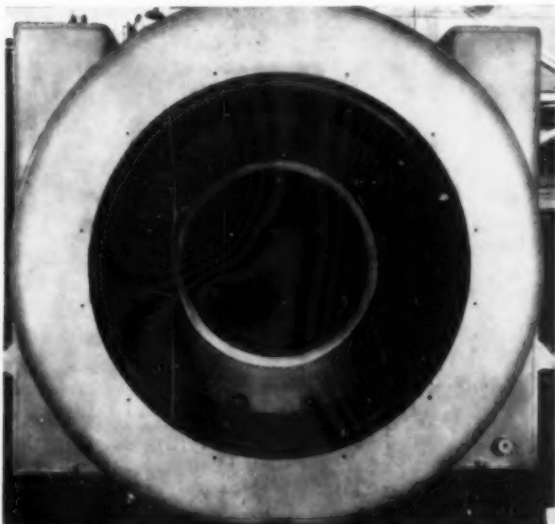
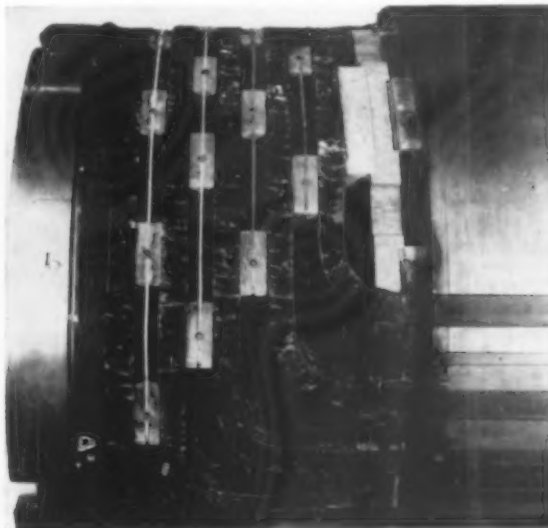
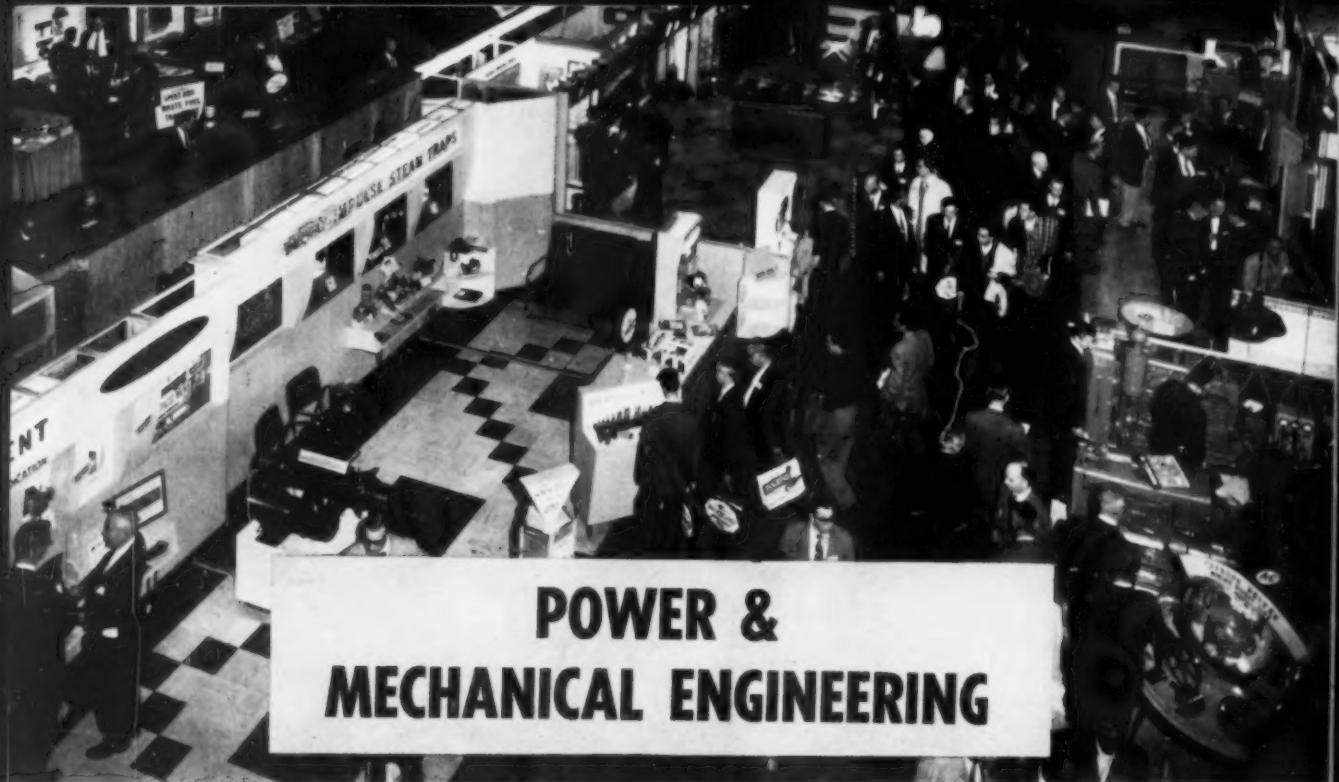


Fig. 5. "Open-end" rotor winding





## POWER & MECHANICAL ENGINEERING

*Auspices of ASME*

### **POWER SHOW . . . . . New York Coliseum • Nov. 28-Dec. 2**

The National Exposition of Power & Mechanical Engineering will be held concurrently with the Annual Meeting of ASME.

The Statler-Hilton Hotel is headquarters for the ASME meeting.

**PROGRESS** in engineering design will be revealed at the 24th National Exposition of Power and Mechanical Engineering by exhibits ranging from complete systems for serving public utilities, refineries and other large plants to mechanical equipment for manufacturing establishments of every size and description. The display will also disclose the latest developments in raw and fabricated

materials, component parts, motors, pumps, blowers and other mechanical equipment and a wide variety of controlling devices and instruments.

Of major interest will be new aids to the economy of electric generating stations. The new services extend from fully automatic control of machines and entire processes to electric accounting machines that produce graphic and tabular records of the vital statistics as fast as they develop.

**New mechanical design** will dominate the Exposition with outstanding developments to be shown in instruments, electronics and materials. A more extensive application of plastics will be evident, while even more noteworthy progress will appear in the selection of

rare and costly metals and alloys for specific purposes to provide more freedom from replacements.

**Piping,** fittings and valves, along with meters, flow and level indicators, separators, traps, mixing valves, feeders and other appliances, will constitute one of the most important displays of liquid and gas moving equipment ever arrayed at any Power Show.

One new service will be offered for carrying out the intricate design of extensive piping layouts, such as are interwoven for mile after mile throughout many large facilities. The system brings into play a newly developed use for electronic computation.

**Liquid and gas transfer** will be represented by a great array of specialty valves, valve operators and controls. A characteristic development this year will be the increased employment of tough metals in otherwise standard designs. Special purpose valves range from miniature instrument and feeder valves of extreme accuracy

#### **Show Hours . . .**

Mon., Nov. 28	Noon— 6 pm
Tues., Nov. 29	Noon— 6 pm
Wed., Nov. 30	Noon—10 pm
Thurs., Dec. 1	Noon— 6 pm
Fri., Dec. 2	Noon— 6 pm

to ponderous motorized pipe line gates.

**Instrumentation** exhibitors are equipped to design and furnish special types of equipment for an entire plant. One offers complete instrumentation including sensing devices, indicators, loggers, automatic controls, data handling equipment, analyzing computers and other instruments. A "performance monitor" will summarize overall performance and indicate

how operating economies may be improved.

**Industrial air service equipment** includes overall air conditioning, air pollution control, air and gas handling, and the movement of dry materials by forced air.

**Package boiler displays** will include several completely automatic units which will deliver a full head of steam in minutes from the touch of the starting button.

A brand new modulating boiler sequencing and control system provides a fully automatic means of operating a bank of boilers so that only the number required to meet the load demand will be under high fire. Boilers are cut in and out of operation by predetermined pressure variations.

**New this year** will be a line of filled Teflon piston and rider rings. It will be exhibited in conjunction with a complete line of mechanical

## VISITORS' MAP — DEEP IN THE HEART OF MANHATTAN

This map highlights the important spots so that visitors may get around New York easily. If there are no taxis available, check your map, subways are convenient. The New York Coliseum where the Power Show will be held is five minutes by subway from the Statler-Hilton Hotel where the Winter Annual Meeting of ASME will be held. The Engineers' Club and the present Engineering building are within walking distance from the hotels. Over toward the East River and diagonally across from the United Nations is the United Engineering Center, which is rapidly nearing completion.



## POWER SHOW CONTINUED

packings, gaskets, seals, Teflon gasketing and expansion joints.

Unique among rust preventives for water systems will be a chemical additive that is odorless, colorless, tasteless and non-toxic. It is available in liquid form and also in crystals for an automatic feeder.

There will be many special displays at the Coliseum, including working models and demonstrations of welding and other techniques. Scale models of complete plants will also be on view.

The most significant plant model

will preview a newly designed 360,000 kw closed cycle atomic water reactor projected by a large utility on the Pacific Coast. When completed, it will be the largest unit of its kind.

E. K. Stevens, president of the International Exposition Company is manager of the Exposition. Headquarters of the management are permanently located at 480 Lexington Avenue, New York 17, N. Y. The Exposition will not be open to the public. Admission will be by invitation and registration only.

## POWER SHOW EXHIBITORS

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ACF Electronics Division ACF Industries	372
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## Air Conditioning Exposition

The 15th International Heating & Air Conditioning Exposition, scheduled for Chicago's International Amphitheatre Feb. 13-16, will cover every phase of the vast heating, refrigeration, air conditioning and ventilation industry.

Specialized equipment on display will include complete systems and components for all types installations, with over 500 exhibits.

The Exposition is being sponsored by the American Society of Heating, Refrigerating and Air Conditioning Engineers in conjunction with their national meeting. Management is by the International Exposition Co., 480 Lexington Ave., New York 17, N. Y.



Now...new from Bailey  
...a "foolproof"

# FLAME DETECTOR

that rejects flames from other burners

**Flame detectors** are sometimes "fooled" by glowing refractories or flames from burners adjacent to that under surveillance. This new Bailey Flame Detector responds only to the flame it surveys . . . assures positive monitoring of coal, gas, oil or combination fuel-fired furnaces. Absence or failure of flame is sensed and accurately signaled—or relayed to control auxiliaries—without use of external relays or amplifiers.

Here are other distinctive features that make this new Bailey Flame Detector outstanding:

**Wide temperature range** . . . is suitable for use in areas

with ambient temperatures from -20 to +300° F. Flame sensing element withstands temperatures up to 600° F.

**Easy inspection** . . . quick disconnect, keyhole mounting simplifies checking of lens condition and detector alignment.

**Simple, solid-state circuitry** . . . Bailey Flame Detector unit contains only 8 components.

**Weatherproof construction** . . . design of Bailey unit makes it suitable for outdoor installation.

Why not have your Bailey Engineer give you more information? Call the Bailey district office, or write us.

A147-1



*Instruments and controls for power and process*

**BAILEY METER COMPANY**

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In Canada—Bailey Meter Company Limited, Montreal

# Compact High Voltage Motor Control

**A NEW CONCEPT** in high voltage motor control "industry's first major design departure in a decade" was announced recently by Allis-Chalmers. Striking change in design is apparent in size and material reduction. The *Space-Maker* unit is exactly one-half the size of previous models, yet with the same rating and capacity as its predecessors.

Some of the firsts introduced by the new controller include: first starter in the 2000 to 5000 volt range to employ a two-high design for space saving and the first completely drawout control on the market. The unique design is possible because of a compact new air contactor that yields significant operating benefits.

*Space-Maker* control features two full-voltage, high-capacity motor controllers, one above the other, in the same space other designs require for one controller. Each can have a full rating of up to 1750 hp maximum at 2300 volts or 3000 hp maximum at 4000-5000 volts. Each has interrupting capacity of 150 mva at 2300 volts or 250 mva at 4000-5000 volts by use of current limiting fuses.

## CONTACTOR INSULATION KEY

Heart of the new equipment is the 400 amp, 5 kv, 50 mva Type 456 air contactor which is setting the pace in the control business with the use of the new glass polyester, flame-retardant, non-tracking *Super Pyro-Shield* insulation.

Use of this insulation in the completely new design reduces contactor size to only 28 in. high by 16 in. wide by 24 in. deep overall, the smallest on the market. The two-high cabinet net size is held to 36 in. wide, 32 in. deep and 90 in. high. One 45 in. high unit comprises a complete full voltage cage starter.

The new drawout feature consists of a wheeled contactor carriage that

carries contactor, main fuses in their supports, main disconnecting fingers, control transformers and control transformer primary and secondary fuses, and a two-pole, double-throw test circuit switch.

A simple racking mechanism enables the operator to easily and safely move the contactor carriage from the operating position to the disconnected position and return.

## WHEELED DOLLY PROVIDED

A wheeled dolly is provided for use to receive the upper contactor carriage when it is drawn out for inspection. When the new control is furnished in outdoor *Shelter-Clad* housings, a lift type dolly can be used.

Overload relays on the *Space-Maker* control are now visible with the door closed. They are reset by buttons on the front door. For complete safety the door cannot be

opened until contactor carriage is in the racked out position.

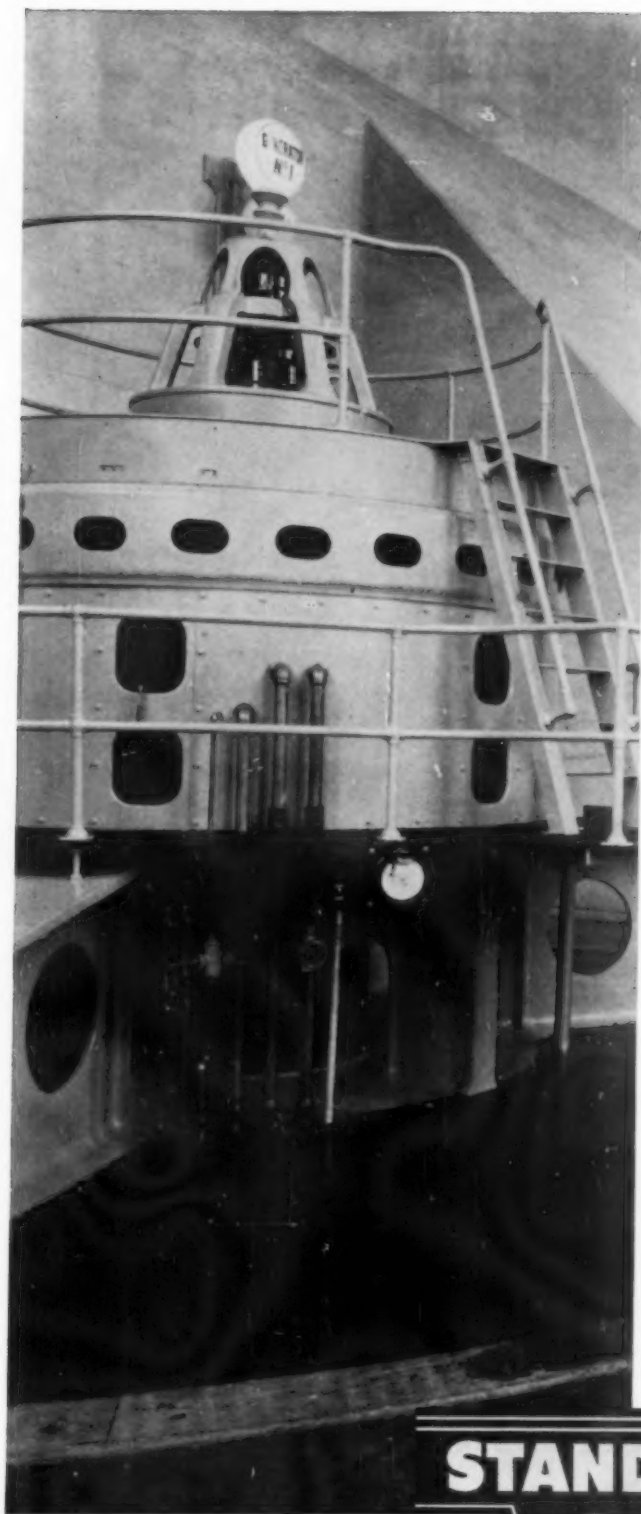
The *Space-Maker* concept will be available as a complete line, with full voltage and reduced voltage, reversing and non-reversing controllers for cage, synchronous, and wound rotor motors.

**ARC CHUTES** of the *Space-Maker* controller's Type 456 contactor lift out easily to expose contacts for inspection. Cart on which contactor rests is also provided for ease of inspection of top contactor in two-high unit. Shutter at rear of cabinet isolates live line terminals when contactor is racked out.

**SHIPMENT** of the new Type 456 contactor will begin during the latter part of the first quarter of 1961. Contactors can be furnished as part of the *Space-Maker* two-high control unit (as illustrated here) or as separate units for OEM use.



With doors open, Type 456 contactors can readily be observed. With units in the racked out position, the bus isolating shutters are closed. Each unit has a rated interrupting capacity of 150 mva at 2300 volts or 250 mva at 4000-5000 volts through the use of current limiting fuses.



## right at scene of action

Continuous action in power equipment means friction, heat and wear—if the *right* lubricants aren't at the *right* places.

For 74 years STANDARD OIL has been *right* at the scene of action with *tailored-to-the-job* lubricants. These valuable years of experience in helping to solve a wide variety of industry's lubricating problems, plus the unexcelled resources for research behind STANDARD OIL Lubricants, are all available to you whenever you have an unusual problem in lubrication.

Whatever your lubrication requirements, your STANDARD OIL representative is able and ready to assist you in getting the *right* lubricant on the job. Call him today.

STANDARD OIL COMPANY  
(KENTUCKY)

**STANDARD  
OIL**

**LUBRICANTS**

## Geothermal Power Plant Starts Operation in California

**THIS NATION'S** first electric power generating station using natural steam from within the earth has begun operation at The Geysers in Northern California where Pacific Gas and Electric Co. has completed its new \$2,000,000 geothermal station.

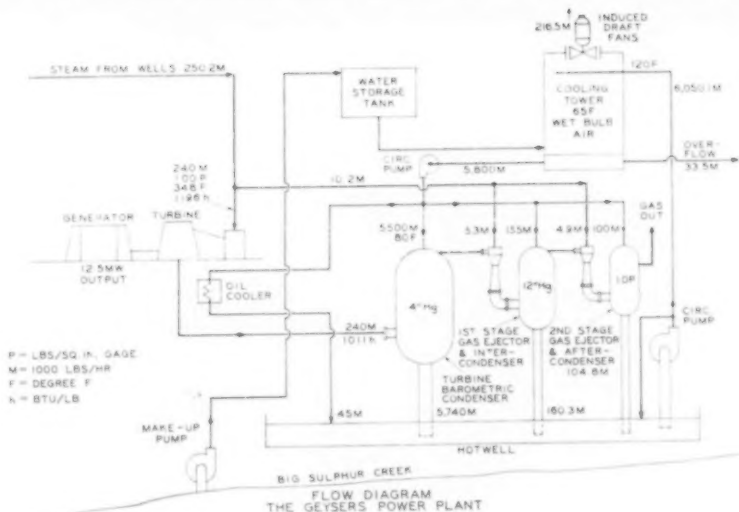
The 12,500 kilowatt turbine generator is being turned by steam from wells drilled into the volcanic geological formations that exist near the surface of the earth at that location.

A pipeline gathers the steam from the producing wells and carries it over a hill a quarter of a mile to the new power plant where it drives the turbine.

The wells vary in depth from 523 to 1,404 feet and from 6½ to 12¼" in diameter. The steam from the wells is slightly superheated. It contains carbon dioxide and smaller amounts of ammonia, hydrogen, methane, hydrogen sulfide and nitrogen.

The condensed steam provides all of the water required for the evaporative cooling of the circulating water, with some left over which overflows from the cooling tower.

The plant is designed so a second unit can be installed later if steam sufficient to operate it is developed by drilling new wells.



A. C. Unit \_\_\_\_\_ Date of \_\_\_\_\_  
Number \_\_\_\_\_ Installation \_\_\_\_\_

Filter \_\_\_\_\_  
Width \_\_\_\_\_ Length \_\_\_\_\_ Depth \_\_\_\_\_

Change filters every March, June, and September  
Record changes below.


### Reminder for Filter Cleaning

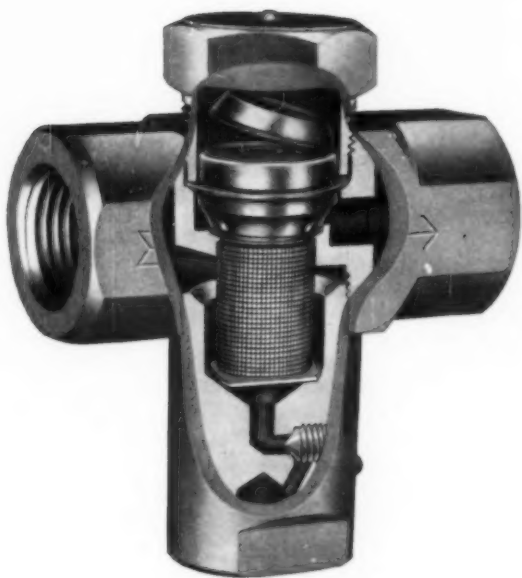
**THE NUMBER** and variety of window air conditioners make air filter replacement a maintenance headache. Yet dirty filters reduce air motion, decrease efficiency, impair performance, and make unit failure more likely.

A small printed label glued to the unit at the time of installation is as helpful as lubrication stickers on an automobile.

By J. A. WEBER, Texas

# NEW **YARWAY** SERIES 130

## IMPULSE STEAM TRAP



**YARWAY IMPULSE® STEAM TRAP,  
STRAINER AND BLOW-DOWN VALVE...  
ALL COMBINED IN ONE SIMPLE UNIT**

**saves money  
saves time  
saves space  
saves work**

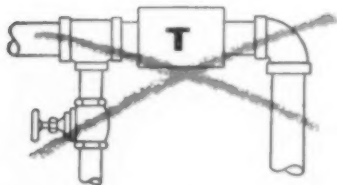
It's new! It's the ultimate in steam trap *simplicity, economy and efficiency*. Yarway offers you the new all-in-one Series 130 Impulse Steam Trap—combining steam trap, strainer and blow-down valve in one small body. **No other steam trap combines such cost-saving, work-saving features.**

This Series 130 Impulse Steam Trap is designed specifically for those thousands of light condensate load applications such as steam main drips, steam tracer lines, meter boxes, and other applications where the Yarway Series 30 trap has proved so successful.

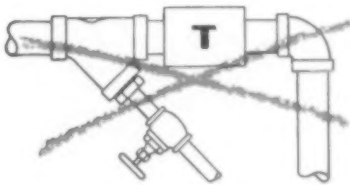
Check these features—replaceable trap valve-seat assembly, all stainless steel construction, woven stainless steel strainer, Allen wrench-operated blow-down valve, good for all pressures 8 to 600 psi, small size, light weight—**Plus savings up to 30% over ordinary trapping hook-ups.**

Try a Yarway Series 130 **TODAY!** Ask your trap distributor for a trial installation in your plant, or just send us the coupon below.

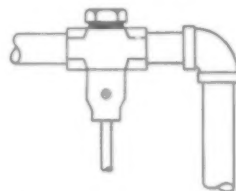
not this ...



or this ...



only this



**FREE 90-DAY YARWAY SERIES 130 TRAP TRIAL—SEND THIS COUPON TODAY**

**YARNALL-WARING COMPANY**

Home Office: 116 Mermaid Ave., Phila. 18, Pa.

Atlanta: 453 Ivey Bldg., 3330 Peachtree Rd., Atlanta 5, Ga.

- ☐ Yes, we'd like to try a YARWAY Series 130 Trap for 90 days. Please arrange it.
- ☐ Send descriptive literature.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

# Centrifugal Pump Clinic

## QUESTIONS and ANSWERS Conducted for SPI Readers

By IGOR J. KARASSIK

Consulting Engineer and  
Manager of Planning  
Harrison Division  
Worthington Corporation

### QUESTION:

**WE ARE LAYING** out a golf course sprinkler installation which will include a 2½" single stage close-coupled motor driven pump designed to handle 300 gpm against a total head of 260 feet. The motor is rated 30 hp at 3550 rpm. The pump will take its suction from a reservoir, the level of which is about 20 feet above the pump center.

The system will be operated manually. It is intended that the attendant start up the pump, with the discharge gate valve open but the sprinkler heads closed. He will then walk over the course, opening such sprinkler valves as he deems necessary. However, circumstances may arise sometimes when as much as 20 minutes may elapse between the time the pump is started and the first sprinkler valve is opened.

I am concerned over the possibility that the pump will operate against dead shut-off until the attendant finally opens the first of the sprinkler heads. Under these conditions, the pump could overheat and burn up.

I have decided to provide a small by-pass line from the pump discharge line back to the suction, with a relief valve in this by-pass line. In the event the pump is operated against shut-off, the relief valve will open and discharge a small amount of water back to the suction. Is this arrangement satisfactory? How much by-pass is needed?

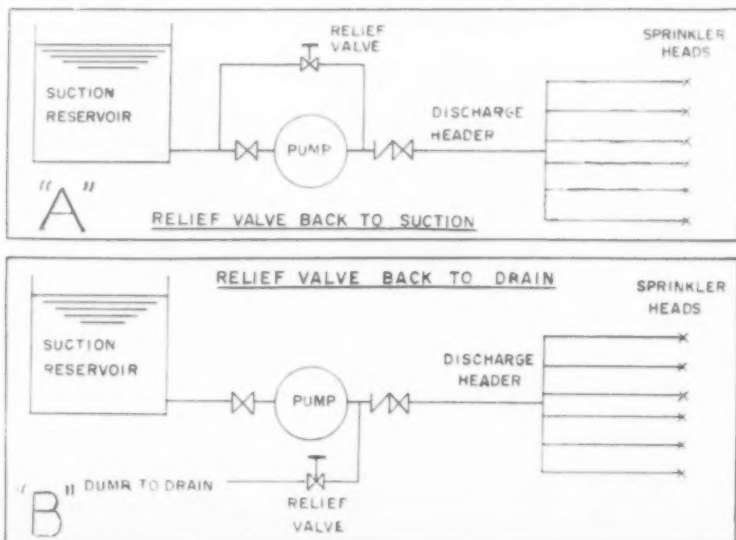
finally the condition you are trying to avoid will be reached.

We can even estimate very roughly how long this will take. Assuming that the pump takes approximately 15 hp at shut-off and that we want to limit the temperature rise to about 15 F, the minimum flow should be set at around 5 gpm. (The rule of thumb is that a pump should handle 30 gpm for each 100 hp at shut-off to limit the temperature rise to 15 F.)

If the total circuit from pump to by-pass line, to suction and back into the pump is about 15 gallons in volume, pumping 5 gpm will cause a complete round trip to take 3 minutes. Neglecting radiation losses, this means that the water temperature will rise at the rate of 15 F every 3 minutes, or 5 F per minute. In the space of 20 minutes, water starting at 75 F

### ANSWER:

**YOUR UNDERSTANDING** that the pump should not be operated against a closed discharge is correct. However, by-passing the water right back to the pump suction as you have indicated in your sketch (Fig. A) will not protect the pump. The heat absorbed by the water on its passage through the pump will not be dissipated and the water returning to the pump suction will be at a higher temperature than on its first trip through the pump. Thus, on each trip through the pump the water will absorb additional heat, until



will reach 175 F and continue rising in temperature.

We can check our calculations in another way. The 15 gallons contained in our closed loop weigh 112.5 lb. The shut-off hp is 15 or  $42.4 \times 15 = 636$  Btu per minute. Neglecting the effect of radiation losses, the temperature rise of the water will be 636 Btu per minute

divided by the 112.5 lb or 5.65 F per minute, which is very close to our first approximation.

If we want this heat to be dissipated, we must dump the by-pass water somewhere else than into the pump suction. If you do not want to run this line all the way back to the suction reservoir (assuming that the reservoir is large

enough to dissipate 636 Btu per minute), you must dump it to drain as in Fig. B.

The operation of the by-pass can be made responsive to a relief valve as you suggest or you can install a hand valve in the by-pass line; the attendant would open it before starting the pump and close it after opening sprinkler heads.

## Work Made Safer by Castered Scaffolds

**HAYS AIRCRAFT** Corporation at Birmingham, Alabama, is not a builder of new aircraft. But as a modification and maintenance facility, the company occupies an essential place between the prime manufacturer and the overhaul shop. Its functions consist primarily of basic research in such fields as aeronautics, aerodynamics and electronics. The end result of the research is to modernize aircraft and to effect new performance potential for aircraft which have outlived their original usefulness.

In order to keep modification and maintenance operations functioning at a high rate of efficiency, a superior system of work scaffolds and material handling dollies is required.

The engineers chose equipment which could be readily adapted to the toughest of tasks. Castered work scaffolds were designed for use in testing, changing parts and modifying the thousands of intricate parts of the huge planes. The scaffolds were built in different widths, lengths and heights to permit easy access.

To assure safe and positive handling, Faultless Scaffold Casters with simultaneous swivel and wheel locks were chosen and have proved themselves 100% successful. Double ball bearing swivels and dual, quick-action brakes eliminate the need for a separate truck lock to control the rigidity of each caster. The brake shoe compensates for wheel wear to insure full braking action at all times.

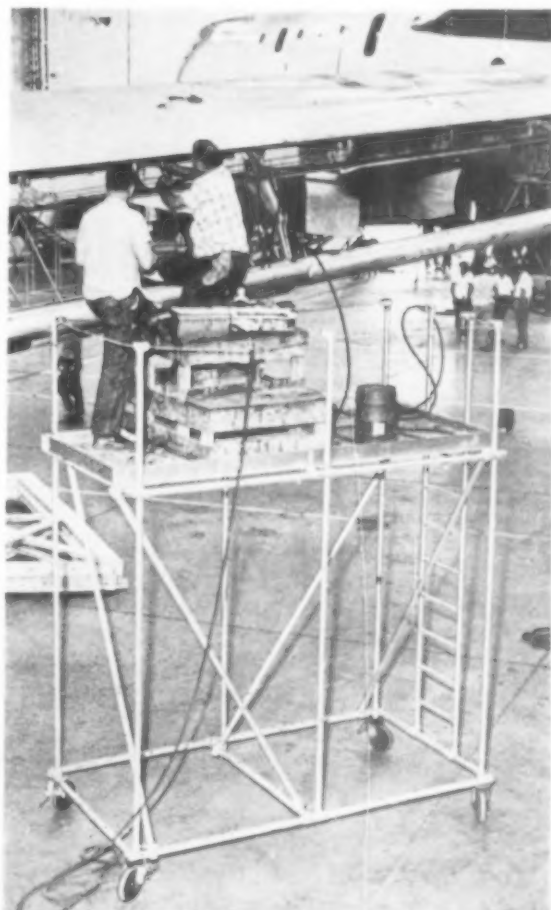
The stability of the units provides a feeling of safety and security to the mechanics, since there is no wobble or movement in the scaffolds which would be a hindrance to an employee doing precision work.

The scaffolds can be quickly mobilized by releasing the four brakes to allow rolling and swiveling action to take place.

Success of the casters on these work scaffolds has prompted their use on a variety of other equipment such as sub-assembly work dollies and transportation

dollies. The sub-assembly work dollies are used as a traveling workbench and must be kept rigid while work is being performed on them and then quickly mobilized and moved to more advanced stages of production.

Transportation dollies are also used extensively at Hays. They provide an efficient and economical means of moving many small parts to the planes for integrated assembly work.



Engine modification is easily and safely carried out on tall work scaffolds.

**"Here at SCOTT we're paper men..."**



"We're specialists at SCOTT PAPER COMPANY.

"We produce a variety of papers and paper products that can display tenacious strength yet be as soft as felt; or can shed water or absorb it thirstily; or can exhibit the properties of materials other than paper.

"We needed only to look at ourselves, as specialists, to be assured that the OTIS specialist approach to elevator maintenance was best for us.

"Here at SCOTT, vertical transportation is a vital part of our production line. Our two OTIS Freight Elevators are used to distribute large rolls of paper and paper stock to production areas. Our two OTIS Escalators carry production personnel between production levels.

"Are we satisfied? We've been using OTIS ELEVATOR MAINTENANCE since the freight elevators and escalators were installed in 1955. Shutdowns have been held to an absolute minimum—by real OTIS professional maintenance."

What is the OTIS specialist's approach to elevator maintenance?  
It is **MEN . . . MATERIALS . . . METHODS.**

**MEN:** Elevator maintenance is no one-man job. It is an organization task requiring experts in many lines. No individual, even if he devoted his entire time to the job, could do it properly. It calls for men with an unusual combination of skills plus long OTIS training in studying parts, assemblies, functions, replacement procedures, testing and adjusting. Some degree of elevator complexity can be gleaned from the illustration at right.

**MATERIALS:** Original OTIS parts and specially designed OTIS maintenance equipment are within one hour of 90% of all OTIS elevators in the U. S. for use in scheduled replacements—and to hold emergency shutdowns to a minimum.

**METHODS:** With more than 40,000 elevators under OTIS maintenance, OTIS has developed an actuarial procedure that replaces wearing parts well in advance of their breakdown point to hold shutdowns to an absolute minimum and assure the highest possible safety.

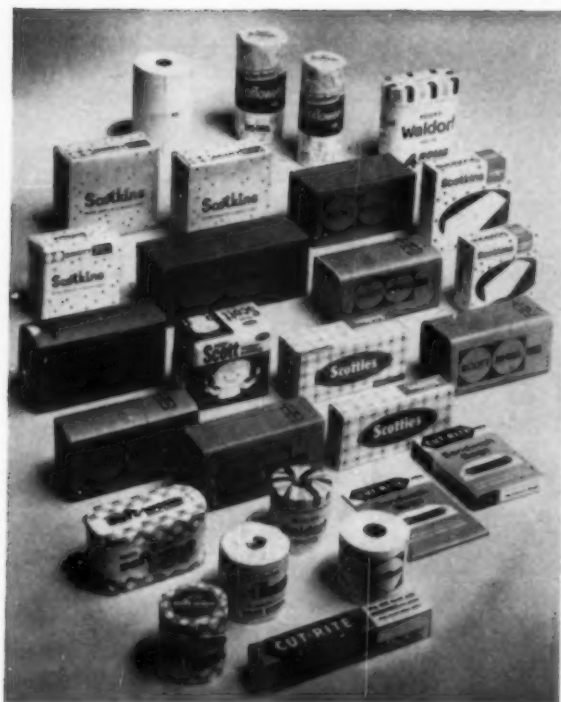
**escalator  
and  
elevator  
maintenance**

ASSURES CONTINUOUS PRODUCTION

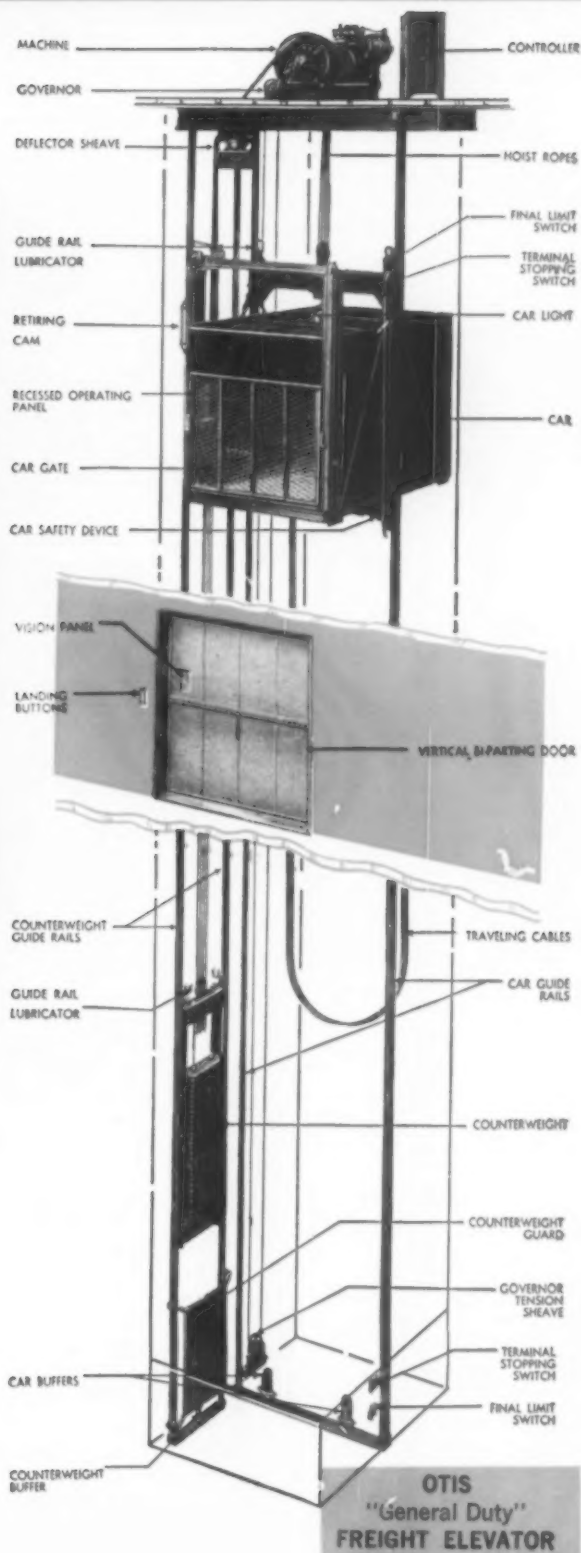


OTIS ELEVATOR COMPANY • 260 ELEVENTH AVENUE • NEW YORK 1, N.Y.  
OFFICES IN 297 CITIES ACROSS THE UNITED STATES AND CANADA

# ...not elevator maintenance men"



**SCOTT PAPER COMPANY**  
WEST COAST DIVISION  
EVERETT, WASHINGTON



# New Information System for Gulf States Utilities

## GULF STATES Utilities Company

has placed an order for a new solid state information system with magnetic drum programming and a digital computer for performing all computing functions. The system will be installed at the Sabine Power Station in Orange County, Texas. Cost of the new system is approximately \$225,000.

The system continuously scans, linearizes, ranges and digitizes all inputs and stores the digital values of each measurement on the magnetic drum. Scanning and data acquisition programs are completely protected and cannot be disturbed when changing data, or by power failure, computing, computer programming or "off-line" use of computer facilities. Whenever needed, new programs can be easily put into the system.

### Alarm Monitoring

Digital data stored on the drum and the stored alarm set points are scanned for alarm monitoring purposes. High and low set points may be programmed for any or all variables so that an off-normal condition will actuate both a visual and audible signal.

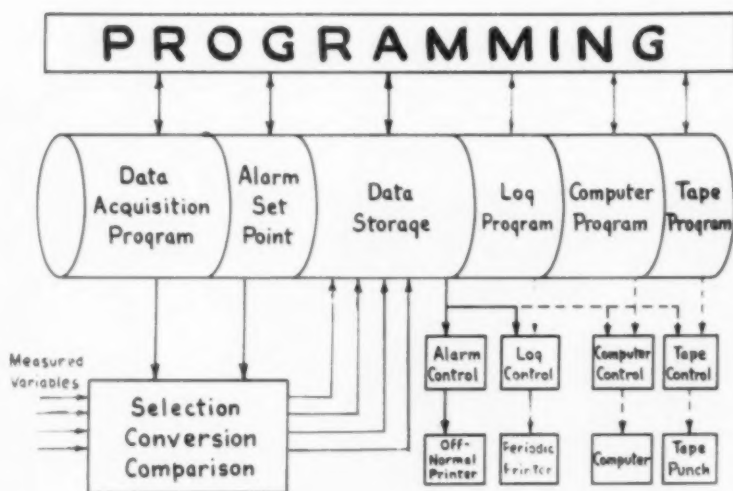
In a separate operation, the stored digital data is scanned for logging purposes whenever a periodic or demand log of those points is required. When directed by the computer program, the stored digital data is fed to the computer. Computations are then made and the computed results stored in the data section of the drum.

Parallel programming of the data acquisition system permits simultaneous and independent performance of system functions as specified.

### System Capacity

Designed to accept 445 input signals, the new system uses a multiple programmed magnetic drum and incorporates a Packard-Bell computer to perform flow compensation, integration, data averaging and various performance calculations.

The magnetic drum has 280 tracks and a total capacity of 27,700 "words." Computer capacity



System continuously scans, linearizes, ranges and digitizes all inputs and stores the digital values of each measurement on the magnetic drum — uninterrupted by any other system function.

Separately, the digital data stored on the drum and the stored alarm set points are scanned for alarm monitoring purposes. Independently, the stored digital data is scanned for logging purposes whenever a periodic or demand log of those points is called for. Also, as directed by the computer program, the stored digital data is fed to the computer when required, computations made, and the computed results then stored in the data section of the drum.

is 4,112 "words." The initial system will use only 11,000 words — less than half of its capacity. A typical word length used in the system is 20 binary bits, with all representations in binary-decimal. Twenty binary bits may represent a "command," the sign and value of a variable, or the sign and value of an alarm set-point.

Expansion of the system could include additional functions such as an automatic programmed start-up of certain parts of the plant such as feed pumps and other units.

### System Expansion

Although the Sabine power station initially will use only part of the system capacity, it can be easily expanded to full capacity without any significant change in existing wiring. All that need be supplied are standard components including relay plug-in modules, and standard power supplies, regulators, amplifiers, annunciator lights and input terminal boards.

The basic system provides additional space for set-point stor-

age and any additional program storage space that may be required. System design permits a "serial" mode of operation so that additions to the amount of data handled do not require additional control equipment.

### Inputs

Inputs to the system include flows, pressures, levels, temperatures, power, volts and amperes. Devices provided to condition these signals include thermal converters, flow, pressure and level transmitters, and d-c transformers. All input switching is accomplished by means of sealed mercury wetted relays.

Logging and alarm printing are accomplished at the rate of 1½ points per second. Data and alarm points are scanned at the rate of five points per second.

The system for the Sabine Power Station was engineered by Stone & Webster Engineering Corporation, Boston, Mass. The order for the complete information system has been placed with Bailey Meter Company.

## Tow Truck Conveyor System

**THE SYSTEM** at Stratton Warren Hardware, Memphis, Tenn., consists of two overhead tow conveyors furnished by Jervis B. Webb Co., and we shall first describe the operation of these conveyors separately.

### Operation Described

Conveyor No. 1 was originally installed with a total length of 2,176 feet but was later increased to 2,432 feet. It is capable of transporting 600 lb tow trucks on 16 ft centers, while traveling at a constant speed of 85 fpm.

Its purpose is to deliver miscellaneous hardware goods into and out of the warehouse from a truck shipping dock at basement level. Therefore, it must negotiate 9 degree ramps to arrive at the first floor level where it allows distribution throughout this floor of the warehouse. At one point on the first floor, it runs adjacent to Conveyor No. 2 to allow transferring of loads between conveyors.

Conveyor No. 2 (similar to No. 1) is 1,632 feet long and travels at the same speed and truck spacing. Its purpose is to distribute incoming material throughout the second floor, and also to receive warehouse tow trucks loaded with orders to be shipped.

Incoming material going to the second floor is transferred from Conveyor No. 1 to Conveyor No. 2 at a transfer point on the first floor level. It then proceeds on conveyor No. 2 up a 12 degree wooden ramp to the second floor level. Conveyor No. 2, after passing through all departments on the second floor, returns to the first floor on a common 12 degree ramp. Orders that have been filled are then transferred to Conveyor No. 1 for delivery to the basement truck loading dock.

Conveyor No. 2 is shown in the foreground of Picture No. 1. The truck most visible in the center of the picture has just come down the 12 degree ramp and if destined for



the truck shipping dock would be transferred to Conveyor No. 1, shown in the background. In this case, both this truck and the one that is just completing the 180 degree take-up turn is circulating on Conveyor No. 2.

Picture No. 2 is practically a reverse view of Picture No. 1 to show the 12 degree wooden ramp. It was felt by the customers that they would make this ramp one bay wide (16 ft), as little would be gained or lost in storage by splitting the bay. In the background and to the right in this same picture can be seen a loaded tow truck coming up from the basement on Conveyor No. 1.

The conveyors are powered by Webb's standard floating drive units traveling at a constant speed

of 85 fpm.

The customer has experienced no difficulty in losing any portion of the load while going around the turns. At first, the customer was somewhat alarmed at the 12 degree ramp and felt it would be necessary to tail gate all of the trucks. This was not the case, however, but a 1" x 1½" piece of wood was added on the back of each truck.

The key to negotiating the inclines and declines is in the design of the tow masts and pusher dogs. A telescoping mast was necessary for entrance to highway trucks.

The personnel this system replaced was between 12 and 16 men. The system also provides more uniform flow of material and better inventory control.

## **A PRACTICAL, STEP-BY-STEP PROGRAM FOR INCREASING PAPER MILL EFFICIENCY AND PRODUCT QUALITY**

Lurking behind every ton of paper produced today are the problems of rising costs which threaten profits. The paper industry sees an increase in production of over a million tons per year for the next 10 years. If production objectives are to meet market objectives, greater mechanization heads the action list . . . to raise efficiency, emphasize quality control, insure a better profit picture.

Westinghouse Progressive Automation is a step-by-step program to help you achieve a greater measure of automatic production. Progressive Automation is thoroughly practical. Applied to an individual mill, it is an individual plan. Thus, you can reach your goals economically, without over- or under-automating.

Today, Westinghouse is ready to help you plan and execute the next step in a program for automatic production. For many, this will be data logging . . . automatic recording and tape storage, at any preset interval, of information from hundreds of points in the mill. Fast. Errorless. A centralized data center observes functions throughout the plant, so you can make accurate and timely decisions on quality control.

What lies beyond? The Westinghouse computer control system with the ability to handle dozens of varia-

bles in a comprehensive program. On-line computers receive data from sensing devices, make computations from process equations, control the process.

Progressive Automation has already proved itself with many manufacturers by stepping up production, improving quality, reducing off-grade losses and human error. One of the many rewards realized from automated equipment is more—and better control of—knowledge, both for present paper products and processes and for future product development.

Westinghouse Progressive Automation is flexible and therefore your capital investment is at a minimum. Controls and systems, appropriate to the stage of automation presently achieved in your mill, can be added as needed.

Westinghouse can help you work out a long-range plan of progressive automation . . . and is prepared to recommend, furnish, install and maintain all equipment to fulfill that plan. Today, and for the first time, there is one source for controls, computer systems and all other basic electrical equipment for paper mills. Transformers, switchgear, motors, gearing, drives. Westinghouse is ready to offer you automation, step by step, economically . . . and will assume complete responsibility for system coordination. Call your Westinghouse representative for complete information.

J-96146

**WESTINGHOUSE PROGRESSIVE AUTOMATION CAN HELP YOU  
POWER-UP FOR PROFIT . . . ELECTRICALLY**

# **WESTINGHOUSE PROGRESSIVE**

# **WESTINGHOUSE PROGRESSIVE**

# AUTOMATION



New Westinghouse Pulse Setter® paper machine control...accurate and flexible equipment for present needs and future automatic operation. Digital techniques permit overall machine speed to be maintained at  $\pm 0.01\%$  of set speed. Close-to-perfection accuracies mean only a 5" variation in 2000 feet! Numerical readout of section speeds and draws is provided.

\*Trade-Mark

Westinghouse



## Southern News Briefs

(Continued from page 22)

This diversification is one of several in the 43-year history of the company, which has the nation's largest known reserves of ball clay, mostly in Tennessee and Kentucky. The company is unique in that it has large-scale cattle and swine production as a successful program for utilizing lands held as clay reserves. Products will include floor covering adhesives, a line of decorative adhesives, and ceramic wall tile adhesives.

## Allis-Chalmers — Ala., La.

Allis-Chalmers Mfg. Co. announces that Clary & Associates, Inc., 205 South 32nd St., Birmingham, has been named a distributor for its water conditioning equipment in Alabama and that portion of Florida directly south of Alabama. E. M. Clary heads the distributorship; John Bullard is financial officer, and Stanford Mangham is sales manager.

In Louisiana, The Hub Armature Works at Lafayette has been appointed distributor for A-C motors and control equipment in seven of the parishes in that area.

## General Electric — S.E.

Establishment of a new Atlanta regional sales headquarters to serve the electric utility industry in the Southeast has been announced by the General Electric Company. Rudolph H. Jackson is manager.



R. H. Jackson

In his new post, Mr. Jackson will be responsible for directing and coordinating sales of G-E capital goods products to electric utilities through 14 local offices in Georgia, Florida, Alabama, Mississippi, Louisiana and Arkansas.

Concurrently, Mr. Jackson announced the formation of five new district organizations and promotion of five G-E executives based in the South as district managers. They are: John C. Ager, Atlanta, manager of distribution equipment sales, Georgia-Florida-Alabama District.

R. Howard Annin, Birmingham, manager of generation, transmission and auxiliary sales, Georgia-Alabama District.

Charles J. Ellis, Tampa, manager of generation, transmission and auxiliary sales, Florida District.

G. Harvey Kellermann, New Orleans, manager of distribution equipment sales, Louisiana-Mississippi-Arkansas District.

W. Stone Leake, New Orleans, manager of generation, transmission and auxiliary sales, Arkansas-Louisiana-Mississippi District.

Mr. Jackson characterized the new organization as "one more closely oriented to the needs of our customers." He said it will enable the company to increase the efficiency and quality of its services to individual electric utilities in the region.

Mr. Jackson, a native of New Bern, N. C., was graduated from the University of North Carolina with a B.S. degree in electrical engineering in 1925 and joined General Electric the following year. During the past 15 years he has served the company

LOWEST COST OPERATION OIL... GAS... OIL & GAS



# TODD "SAV-PAC"

### FORCED DRAFT—REGISTER TYPE PACKAGED BURNER SYSTEM

FULLY AUTOMATIC OR SEMI-AUTOMATIC . . . this high efficiency system is manufactured in a wide variety of sizes and models, arranged for firing steam boilers and high temperature hot water generators of all types up to the equivalent of 100,000 lbs. of steam per hour. Available with axial flow blowers or centrifugal blowers fitted with electric motor or steam turbine drive as required.

"SAV-PAC" is built for trouble-free performance, extra economy using all grades of fuel oils, gaseous fuels or combinations of both. Self-contained unit includes register-type burner, forced draft fan, air-fuel controls, wiring and piping in separate enclosed panels, mounted complete.

Also available TODD ROTO-PAC fully automatic forced draft rotary burner systems.

Write for complete details and specifications

## TODD SHIPYARDS CORPORATION

PRODUCTS DIVISION

Sales and Service Departments: Columbia and Halleck Sts., Brooklyn 31, N. Y.  
Plant, Sales and Service: P. O. Box 9666, Houston, Texas

in various executive sales positions in Atlanta. Prior to his recent promotion, he was district manager of user industries sales.

### Noland Co. — Tampa

James Goode Branch has been appointed Tampa manager by the Noland Company, Inc., mechanical



equipment wholesalers. Warehouse and offices are at Meridian and Washington Streets, Tampa, Florida.

Mr. Branch joined Noland in 1933. His assignments have included office manager at Washington, D. C., and supervisor of Arlington, Va., operations — his most recent company assignment before coming to Florida. He is a native of North Carolina.

### Whitman & Barnes — Fla.

Whitman & Barnes, Plymouth, Mich., manufacturers of drills, reamers and other cutting tools, announce

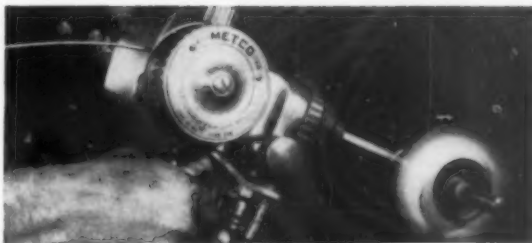


the appointment of William Crawford as Factory Sales Representative.

Having completed the company's training program, Mr. Crawford will work with W&B distributors in servicing customers throughout Florida.

(Continued on page 70)

## Complete your shop with this modern metallizing installation



### WIRE GUN

Sprays any metal that can be drawn into wire form.

### POWDER GUN

Sprays hard-facing alloys and ceramics in powder form.



Without metallizing no maintenance or "job" shop can offer the same complete service as the shop that uses industry's low-cost "putting-on" tool.

With modern, low-cost metallizing equipment you can spray carbon steels, stainless, babbitts, brass, bronze, nickel, aluminum, tin, zinc, special hard facing alloys including tungsten carbide.

- Save up to 90% of replacement costs on machine repair jobs
- Do your own hard-facing at high speed, low cost
- Apply long-wearing, corrosion-resistant coatings

### A real opportunity for the smaller shop

Thousands of large, well-known companies and shops have been metallizing users for many years, not only in maintenance work but in production applications on original equipment. Now, with modern low-cost metallizing equipment this high-speed "putting-on" tool is within the reach of even the smallest shop.



### FREE BULLETIN

Send off the coupon for detailed information — find out how a metallizing installation can pay for itself in a very short time. No obligation, of course.

Mr. Walter Gagnet, Jr. Dept. 5  
Metco Inc.

2035 Lafayette St., New Orleans 16, La.

Please send me free bulletin on metallizing.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



**METCO INC.**

FORMERLY METALLIZING ENGINEERING CO., INC.

Flame Spray Equipment and Supplies

2035 Lafayette St., New Orleans 16, Tel EXPRESS 3232

## Southern News Briefs (Continued)

### NISA — St. Louis

August A. Baechle joined the St. Louis headquarters staff of the **National Industrial Service Association, Inc.**, in September. Mr. Baechle,



who was formerly an application engineer for Allis-Chalmers Mfg. Co., is one of three engineers serving NISA. J. Arthur Turner, Jr., of Tampa, Fla., is international president.

The association, which has 1,500 member firms in North America, will be renamed "Electrical Apparatus Service Association, Inc.," in April, 1961.

### Fisher Governor — N. C.

W. W. Williamson has joined the R. E. Mason Company, **Fisher Governor Company** sales representative in



Charlotte, North Carolina. Mr. Williamson has had 13 years' experience as a sales engineer, and has filled various managerial capacities in the Southeast. He is a charter member of the Carolina Piedmont Section of the Instrument Society of America, and has held the offices of Secretary and Treasurer.

### H. Clay Moore & Assoc. Atlanta, Georgia

**H. Clay Moore & Associates**, Southeastern representatives of several leading manufacturers of power plant equipment, announce the retirement of H. Clay Moore, following his thirty-eight years of active participation in sales work. Mr. Moore is succeeded by his son, H. Clay Moore, Jr., as President of the firm; just as he himself succeeded his father in this same work in 1930. So the third generation continues the business begun in 1902 by the late H. Clay Moore, Sr.

Allen W. Ripley, Jr., who has been an esteemed and valuable member of this organization for some twelve years, will continue his association. Also, an important addition to the organization will be announced at an early date.

H. Clay Moore & Associates also announce the removal of their offices on December 6, 1960, to new quarters at 3110 Maple Drive, N. E., Atlanta 5, Georgia.

### S&C Electric — S.E.

A national Sales Services Division has been created by **S&C Electric Company**, Chicago, Ill. Jack B. Castle heads the new division.



Philip J. McLaughlin has been promoted to manager of the East Central Sales Division, which includes Kentucky, Florida, Georgia, Tennessee, and Alabama. Mr. McLaughlin was graduated from Rensselaer Polytechnic Institute with a bachelors degree in electrical engineering and belongs to the American Institute of Electrical Engineers. His address is 441 Riverside Drive, Villa Park, Ill.

### TCI — Atlanta

Land A. Rigsby, Jr., has been appointed assistant manager of sales in the new Atlanta District Sales Office of **United States Steel's Tennessee Coal & Iron Division**. He advances from the position of organization counselor in TCI's Industrial Relations Department.

Most of Mr. Rigsby's career has been in the Sales Department. He served in the Jacksonville, Fla.; Charlotte, N. C.; and Fairfield, Ala., District Sales Offices before being transferred to Industrial Relations, in 1958.

### Olin Mathieson — Ky.

James R. Whitlock has been appointed manager of the Olin Aluminum branch sales office at Louisville, Ky., it was announced by the Metals Division of **Olin Mathieson Chemical Corporation**. He was previously an industrial sales representative.

Mr. Whitlock was graduated from Western Michigan University with a B.S. degree, and was associated with the Kaiser Aluminum & Chemical Corporation from 1954 until mid-1957 when he joined Olin Mathieson.

### General Rubber — Okla.

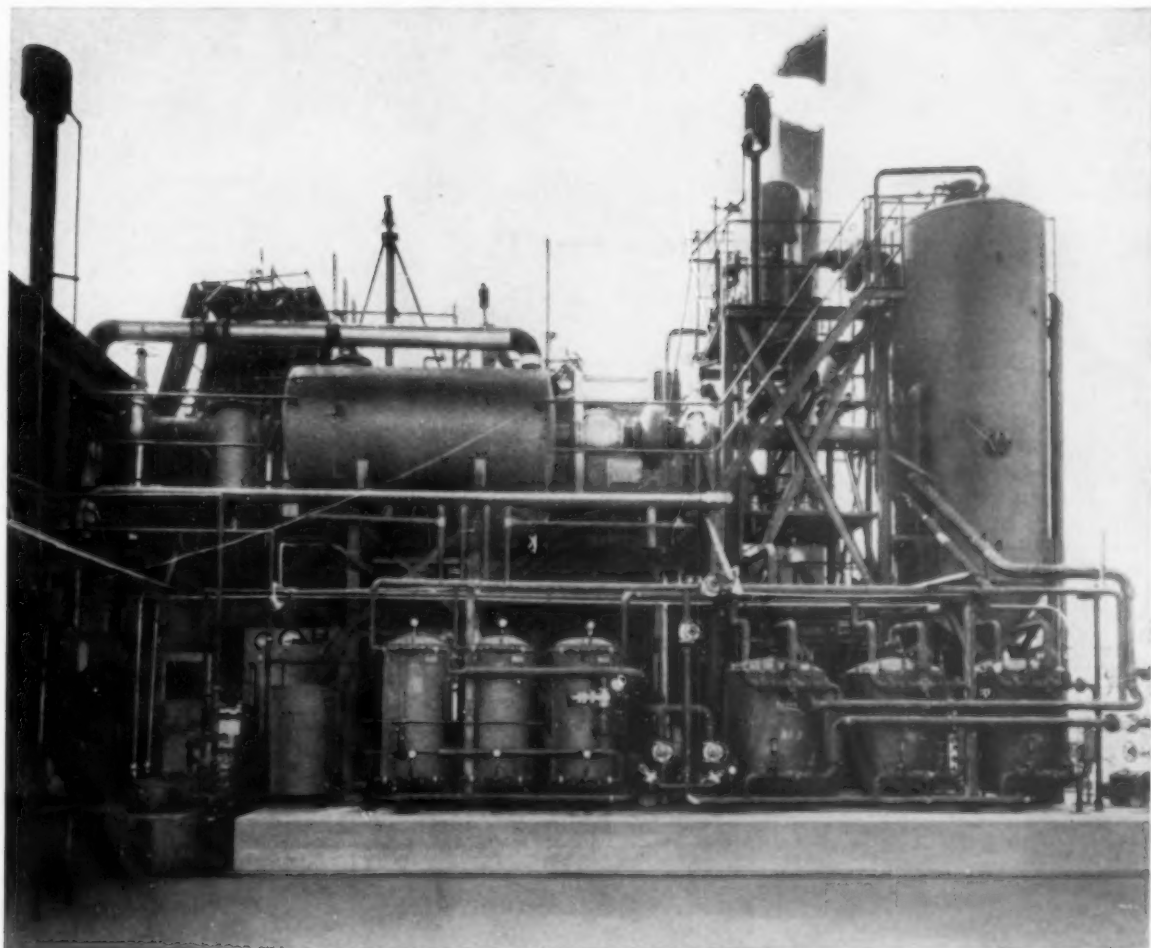
The Special Products Division, **General Rubber Corporation**, Tenaflly, N. J., announces the appointment of the Eldon C. Thomas Company, 1000 S. W. Second St., Oklahoma City, as its exclusive sales representative for the State of Oklahoma.

### McQuay — Alabama

**McQuay, Inc.**, announces that Brownlee-Morrow Engineering Co., 745 N. 44th St., Birmingham, Alabama, has been appointed to represent McQuay's heating, ventilating and air conditioning lines.

Brownlee-Morrow was organized in 1952. Gordon Morrow and Lawrence Brownlee are principals of the company, and both were graduated from the University of Alabama in engineering in 1949. Mr. Morrow, prior to the company's organization, was a sales engineer with Air Engineers of Birmingham. He is active in ASHRAE. Mr. Brownlee was previously employed as a manufacturers' agent covering the same field and is a registered professional engineer and a member in ASME.

# ALLIS-CHALMERS



6000-gph hot lime-hot zeolite water-treating system and deaerator installed at a large West Coast industrial plant.

## Hot process - hot zeolite system eliminates boiler sludge and scale

**Zero hardness in the effluent** — result of Allis-Chalmers highly effective hot process-hot zeolite system — means scale and sludge-free operation of your boilers, economizers, feedlines, feed pumps and feedwater heaters.

In addition to zero hardness, the low alkalinity, silica and solids, and high pH of the effluent make the combined hot process and zeolite systems suitable for makeup to boiler cycles operating at pressures as high as 900 psig.

Your nearby A-C water conditioning engineer can give you further system details or arrange for a proposal or water analysis. **Allis-Chalmers, Water Conditioning Department, Milwaukee 1, Wisconsin.**

A-1245



One source for all water conditioning facts, chemicals, equipment, service! Write for free hot process-hot zeolite bulletin 28X7559 . . . zeolite water softener bulletin 28B7107A . . . and deaerator bulletin 28B8853.



# NEW Product Briefs

... there is always a **BETTER WAY**

## FOR MORE INFORMATION ON FOLLOWING ITEMS

Fill in Code Number on Return Card — Page 75

### Bi-Metallic Pipe

Y-1

New advances in the manufacture and use of bi-metallic pipe have been announced by **Gray Tool Company**, P. O. Box 2291, Houston, Texas.

The pipe provides all the fabrication and strength advantages of a carbon steel system, combined with



the corrosion resistance of the best alloy materials, and at a fraction of the cost of solid alloy piping.

In the Gray process, a seamless lining is hydraulically expanded into the base pipe, forming the lining tightly against the inside of the base pipe material. Additional pressure expands the base pipe, and on return to normal operating pressure, the lining is firmly held against the base pipe by means of differential contraction.

By using this system, the choice of materials for bi-metallic pipe is virtually unlimited. Usually, the base pipe is standard carbon steel in regular pipe sizes and schedules, but the base material can be varied to meet any particular need. The photograph shows a 16" pipe with monel lining.

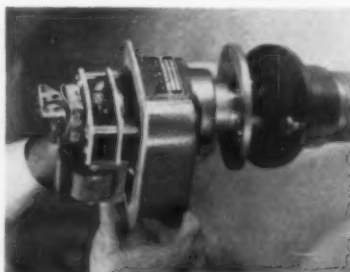
Linings are most frequently furnished in monel, nickel, and stainless steel, but the selection is in no way limited. Selections of linings can be made on the basis of quality of corrosion resistance, availability and ease of fabrication.

Gray bi-metallic pipe can be fabricated almost as easily as carbon steel materials. It can be butt welded, flanged and bent without damage to the lining or the bond between the lining and base material.

### Flame Detector

Y-2

**Bailey Meter Company**, 1050 Ivanhoe Road, Cleveland 10, Ohio is offering a new solid-state flame detector which senses the presence of a flame and operates a relay to provide an alarm



signal or indication in the event of flame failure.

Designated Type UF1100B, the new compact unit which is responsive to radiation in the spectrum from 2000 to 2800 angstrom units operates effectively at ambient temperatures from minus 20 F to plus 300 F. A flame detector (Type UF1000B) which transmits a signal to a static switch is also available.

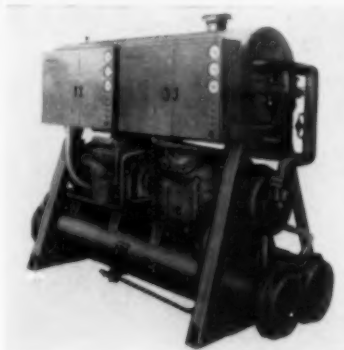
The flame detector is designed to monitor individual burners in gas, oil, coal or combination fuel-fired

furnaces. It responds only to the flame under surveillance and not to adjacent flames or infrared radiation from glowing refractories. The flame detector sensing element which easily withstands temperatures up to 600 F may be mounted remotely from the detector case.

### Water Chillers

Y-3

A new line of packaged water units for industrial and commercial air conditioning installations has been introduced by the **Westinghouse Electric Corporation**, Pittsburgh 30, Pa.

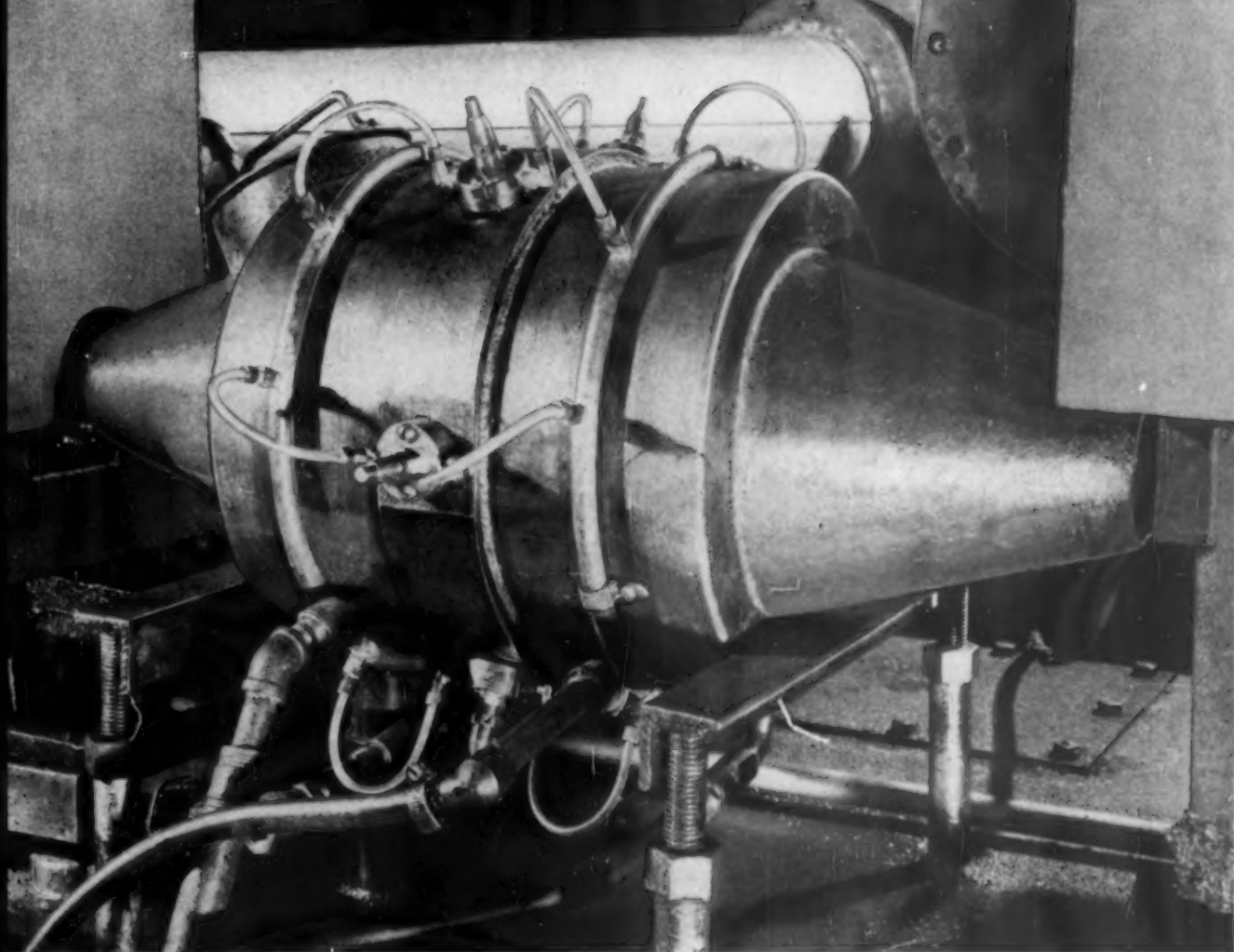


The PKB chillers include eight sizes in ratings from 20 to 100 tons.

A "Guardistor" overtemperature control circuit provides positive motor protection against overheating from any cause: excessively high or low voltage, single phasing, or loss of Freon from the compressor. In addition, quick trip overload heaters are included for positive six-second kick out on any overload condition, even on cold start.

The larger units, rated at 60, 80, and 100 tons, have twin compressors that provide step starting, demand charge savings during mild seasons, and protection against complete loss of service in event of failure in one system. Each unit is compact and complete with a wired control center that includes starters and safety operating controls.

(Continued on page 84)



## Here's where pressure tubing is wrapped in a protective fog

As soon as USS National Seamless Pressure Tubing has passed its soundness tests it is protected against corrosion. A mixture of specially compounded warm oil and air is sprayed as a fog on the tubing. The oil quickly dries and forms a clear, protective coating .0015" thick. It acts as protection against corrosion during shipment and storage, and is yours for the asking *at no extra cost*.

USS National Seamless Pressure Tubes are safe. They are made by piercing a white hot steel billet of the finest steel. Rigid testing of each length of pressure tubing is added insurance against trouble.

For your next installation, consider USS National Seamless Pressure Tubing. It's stocked all over the

country by National Tube Distributors. They can furnish helpful information on the use of USS National Seamless Pressure Tubing and give you speedy, efficient delivery. Our trained Mill Service Force is also available for field consultation by writing: National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

*USS and National are registered trademarks*

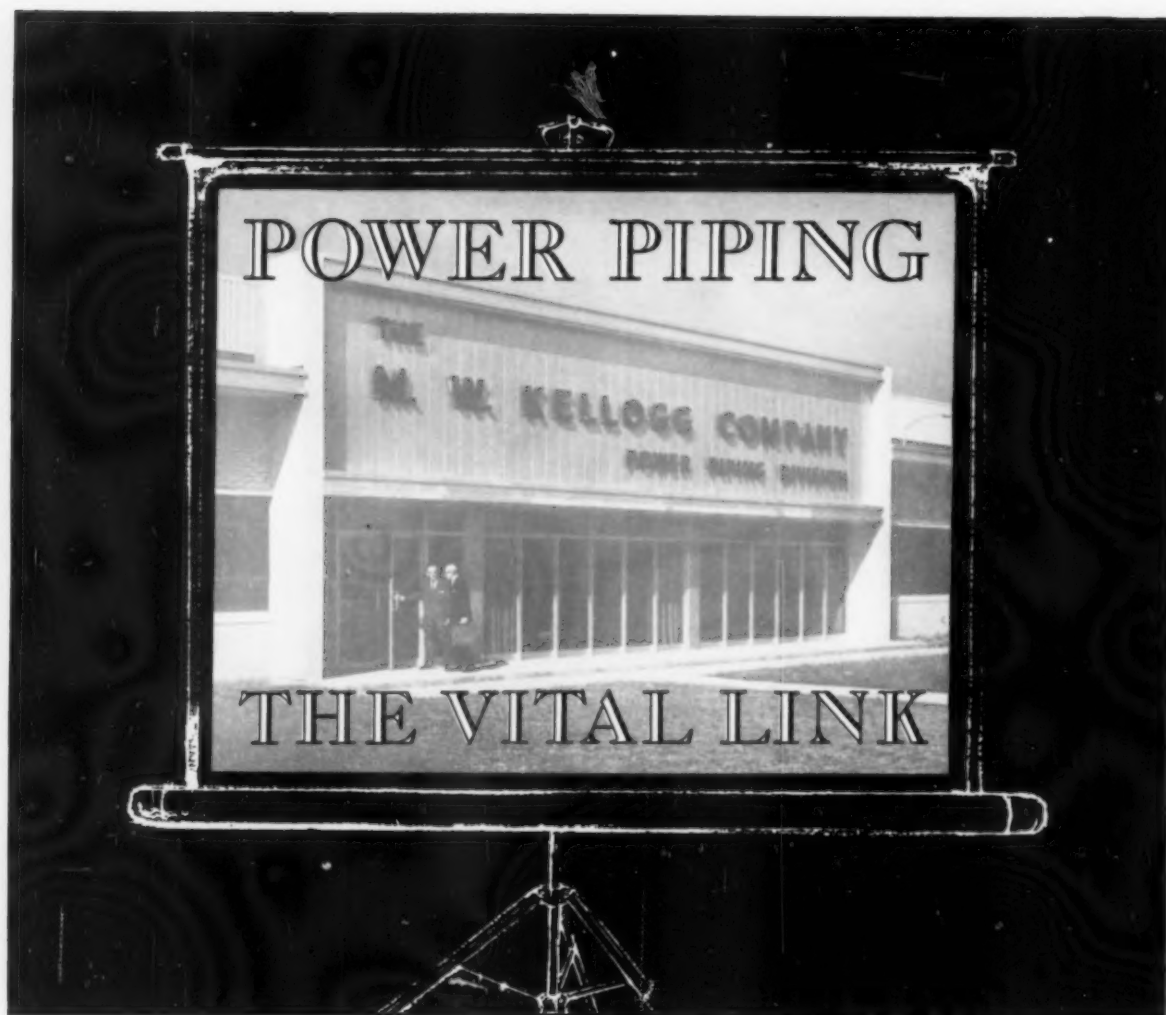


**National Tube  
Division of  
United States Steel**

Columbia-Geneva Steel Division, San Francisco  
Pacific Coast Distributors  
United States Steel Supply Division  
United States Steel Export Company, New York



This mark tells you a product is made of modern, dependable Steel.



## NEW FILM shows how quality power piping helps the nation live better electrically

Just produced by The M. W. Kellogg Company, and available January 1, 1961, this sound-color film on power piping is valuable viewing for utility managements, engineers, and others concerned with the generation of electric power. Explaining in full the subject of power piping, "The Vital Link" also provides an interesting education for users of electricity.

Showing what power piping is, does, and how it is made and erected, and its importance to the utility industry, this new film takes you first into the central station of a large electric utility. It then guides you through

Kellogg's new plant at Williamsport, Pennsylvania—the most modern ever designed specifically to manufacture power piping for electric utilities.

In Williamsport, you will follow the many manufacturing steps necessary to assure the highest quality product from the time the raw materials arrive in the plant until finished assemblies are shipped. The final step—

field erection in a customer's plant—shows the importance of sustaining quality work to insure efficient production of electricity.

For arrangements to view "The Vital Link" in your own offices or at outside meetings, contact the nearest office of Kellogg's film distributor:

**MODERN TALKING PICTURE SERVICE INC.**  
Three East 54th Street, New York, N. Y.

**POWER PIPING DIVISION • THE M. W. KELLOGG COMPANY**  
Plant & Headquarters: Williamsport, Pa. Sales Offices: 711 Third Ave., New York, N. Y.

A SUBSIDIARY OF PULLMAN INCORPORATED

Offices of other Kellogg companies: Toronto, London, Paris, Rio de Janeiro, Caracas, Buenos Aires



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SOUTHERN POWER & INDUSTRY  
806 Peachtree St., N. E.  
Atlanta 8, Ga.





# NEW Catalogs & Bulletins

... there is always a **BETTER WAY**

## MAINTENANCE—TOOLS EQUIPMENT & METHODS

**3—Metallizing** — Use industry's low-cost "putting-on" tool. Now within reach of the smallest shop. Bulletin tells how you can spray carbon steels, stainless, babbitts, brass, nickel, aluminum. — METCO.

**6—Tool Truck** — Save time with this compact truck carrying full tool selection to emergency repair jobs. Four drawer unit described in bulletin 8141-A. Semi-pneumatic 10" balloon tires ease heavy loads over rough pavements. — SNAP-ON TOOLS CORPORATION.

**8—Ceramic Coatings** — Chempro sprayed ceramic coatings to resist abrasion, erosion and corrosion described in Bulletin CP-28. Ideal for shaft, shaft sleeves, impellers, valves, cams. — CHEMICAL & POWER PRODUCTS, INC.

**10—Floor Maintenance** — Catalogs show how to maintain floors faster for less money with Lincoln-Wilshire automatic scrubbers, power sweepers and polishers. — AMERICAN-LINCOLN CORP.

**14—Hose & Fitting Needs** — Complete Weatherhead line described in Bulletins — flared, flareless, or pipe fittings; brass, stainless, carbon; pressures to 10,000 psi; sizes 1/4" to 2" O.D.; production or small maintenance quantities. — DIESEL INJECTION SALES & SERVICE.

**17—Mechanical Packings** — 32 page Cat. PC-103 describes a variety of packings and gaskets, including self-lubricating, sheet and molded packings. Includes application charts and price information. — GREENE, TWEED & CO.

**27—Corrosion Control Systems** — Brochure 9111 outlines five-step procedure for primary protection and preventive maintenance of all metal surfaces subject to acids, alkalis, solvents, fumes and gases. — TRUSCON LABORATORIES.

**35—Stop Corrosion** — 4 page bulletin tells how Alkasteem neutralizes carbon dioxide and Ox-Gem reacts with oxygen to stop corrosion in boilers, heaters, condensate returns, steam lines and traps. — ANDERSON CHEMICAL COMPANY, INC.

**38—Heavy-Duty Wrench Set** — Bulletin 8141-C details the Loxocket 521-EHD-B. Metal case containing 17 sockets from 1 7/16" to 3 3/4", ratchet, sliding bar and two extensions — 8" and 16" — ready to go on

any assignment. — SNAP-ON TOOLS CORPORATION.

**58—Tube Expander Drives** — Bulletin 581 gives data on complete line of Torq-Air-Matic automatic tube expander drives and explains the importance of precision control in tube expanding. Chart to aid selecting right model for the right job. — THOMAS C. WILSON, INC.

**75—Storage Racks** — How you can build them faster with Kee Klamp slip-on fittings described in Catalog K-25-D. Allen wrench only tool needed. Simple to erect; easy to dismantle. 58 varieties for pipe sizes 3/8" to 2". — KEE KLAMPS.

**77—Plant Health Aid** — Automatic footsprayer dispenses skintoughening solution for prevention of athlete's foot. One gal of solution sufficient for 3,000 treatments. Catalog S-12 gives details. — ONOX, INC.

**78—Control Heat & Glare** — New folder tells how Sun-X Glass Tinting (transparent alkyd-based liquid plastic by DuPont) is applied directly to existing glass by flow process without spray or splatter. Bonds tightly. Wash in usual manner. — AMERICAN GLASS TINTING CORP.

**84—Zinc Coatings** — Bulletin No. 4 describes Galvanox-Type II (Epoxy) a zinc-rich coating to be used as repair item for damaged areas on galvanized sheets and structures. Provides both cathodic type and barrier protection. — SUBOX, INC.

## FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

**100—Power Plant Pumps** — Bulletin BJP 58-8 covers complete line of standard pumps for power plant requirements — from 12,000 hp, doublecase boiler feed pump, to condensate, circulating and booster pumping duty. Also, special pumps for nuclear power plant installation. — BYRON JACKSON PUMPS, INC.

**122—Industrial Fans** — Bulletin 702 covers Type XL fans for air and material handling. Volumes to 130,000 cfm pressures to 18" SP. Catalog 855 describes Pressure Fans. Volumes to 12,000 cfm, 10" to 50" SP. — CLARAGE FAN CO.

**128—How to Solve Pumping Problems** — 36-page booklet gives general explanation of rotary gear pumps and factors involved in pumping; three sample problems; technical data — graphs and tables. — ROPER HYDRAULICS, INC.

**142—Centrifugal Pumps** — Full line of single stage horizontally split case centrifugal pumps described in 16 page Bulletin 721.6; capacities 200-6400 gpm; heads up to 425 ft; maximum standardization and interchangeability of parts. — GOULDS PUMPS, INC.

**143—Chemical Feeders** — 36 page Bul. 1136 describes metering pumps — types, construction, displacement and operating pressures. Gives handling recommendations for chemicals, acids, etc., and volumetric conversion tables. — MANZEL.

**160—Boiler Feed Pumps** — 12 page Bulletin 122 describes and illustrates the type BFI high pressure pumps. Design features, service ratings and engineering data included. — PACIFIC PUMPS, INC.

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**182—Centrifugal Fan Equipment** — Catalog 515 covers complete, ready-to-run centrifugal fan equipment. Capacities 400 to 14,000 cfm. V-belt and direct drive units. Universal discharge feature. Available for outdoor installation. — CLARAGE FAN CO.

## INSTRUMENTS—METERS CONTROLS—REGULATORS

**203—Electric Control System** — Bulletin E74-1 describes new control system operating over —25 to +25 volts d-c signal ranges. Electrically and electronically operated components are shown along with transmitting and power units. — BAILEY METER COMPANY.

**207—Control Centers & Systems** — Combustion safeguard and automation packaged control centers insure full coordination of complete system, place responsibility on one source, insure correct wiring, and reduce field labor. Catalog C11 illustrates variety of designs and circuits now in use. — WEBSTER ENGINEERING CO.

(Continued on page 78)

## Bulletins (Cont.)

**211—Butterfly Valves** — Folder supplement to Catalog 307 stresses flexibility in valve line for controlling large volumes of liquids or gases. Valve actuators, special arrangements, shaft extensions, and electric actuators and positioners are featured. — MASON-NEILAN.

**212—Self-Powered Controls** — Bulletin 620 describes self-powered automatic temperature regulators — no compressed air or electrical wiring required, no delicate mechanisms to adjust, no packing glands to stick, no shut-down due to power failure. — SARCO COMPANY, INC.

**228—Fuel Cut-Outs & Water Level Alarms** — Brochure D2 — Electrode type equipment for installation on water columns to provide fuel cut-out, high and low water level alarms and pump cut on and off. For pressures to 2500 psi. — RELIANCE GAUGE COLUMN CO.

## KEEP UP-TO-DATE USE SPI READER SERVICE

See pages 75 & 76

**235—Liquid Level Gauges** — Bulletin 463A describes automatic remote reading systems for nearly any liquid. Features include easy to read dial indication. — LIQUIDOMETER CORP.

**244—Desuperheaters** — 4 page Bulletin 1024-A describes steam-assist desuperheating. Charts show the close control of temperature which is possible during wide load fluctuations. Schematic diagrams of piping arrangement and control systems. — COPES-VULCAN DIV.

**255—Temperature Regulators** — "Sliding Gate" units are simple, low cost, self-operating, automatic control valves for heating or cooling applications. Action easily reversed by rotating seats 180°; self-powered — no electricity or compressed air needed; easy to install. Bulletin J-180-1 describes ten standard ranges from 35-450 F. — OPW-JORDAN.

**267—Remote Liquid Level Indicators** — Bulletin RI-1825 describes indicators for pressures up to 3000 psi — advantages, operation and specific installations. — YARNALL-WARING COMPANY.

**281—Diaphragm Control Valves** for accurate control of pressure-temperature and liquid level described in Catalog J-170. Designed specifically for instrumented process systems requiring linear flow characteristics and tight shut-off. — OPW-JORDAN.

**293—Metering & Control Systems** — Bulletin 500, 4 pages, discusses pneumatic and electric telemetering. Covers components making up the systems. — BAILEY METER CO.

### PLANT CONSTRUCTION—WELDING EQUIPMENT—SPECIALTIES

**300—Buyer's Guide** — Up-to-date industrial and maintenance building products stock list. Includes complete listing of all Rasco distributed products plus branch locations. — REYNOLDS ALUMINUM SUPPLY CO.

**301—Vacuum Cleaning Systems** — How portable and stationary systems cut costs and increase plant efficiency shown in Booklets P8 and AB-100. Eight heavy duty units (1½ to 15 hp) for cleaning hard to get at areas, reclaiming valuable materials. — U. S. HOFFMAN MACH. CORP.

**310—Incinerator** — Metal cased, insulated, refractory lined incinerators for industrial and commercial use. City smoke code approved. Fast, economical installation — any size and capacity. — NORTH STATE PYROPHYLLITE CO.

**314—Plant Heating Units** — Infra-Red comfort heating gas-fired units with no moving parts described in Bulletin PC 1-60 G. AGA and UL approved. — PANELBLOC DIV., BETTCHER MFG. CORP.

**315—Pressure Vessels** — Catalog 100 discusses plate fabrication problems and shows how company custom-fabricates hot water storage heaters, tanks, air receivers, blow-off tanks. Corrosion resistant linings and materials featured. Suggested specifications and other valuable technical data given. — J. J. FINNIGAN CO.

**317—Drier Compressed Air** — Bulletin 130 shows how Aero After Cooler cools compressed air or gas below temperature of surrounding atmosphere; no further condensation in air lines. Installed outdoors. Saves cooling water. Gives better operation of air-operated tools. — NIAGARA BLOWER COMPANY.

**323—Mercury Vapor Fixture** — Industrial color corrected units described in Bulletin 401. "Stabilux Socket" secures bulb end of lamp, eliminating lamp rupture and breakage from vibration. — WIDE-LITE CORP.

**324—Painting New Plants** — "Plan Painting of New Plants to Reduce Costs" describes how company's lead-suboxide paints can save 1 or 2 coats of paint on new plants. Evenual repainting costs are cut as well since these paints form a dense, metallic lead film which can be recoated without expensive scraping, sanding or repriming. — SUBOX INC.

**325—Water Storage** — The Cylindroid, a functional design for large-volume, low-cost, ground-level water storage described in 4-page catalog. Light steel construction, and

smaller field erection crew are among savings over standard ground-level tanks. — GRAVER TANK & MFG. CO.

**332—Heat Transfer Equipment** — If you have material to liquefy, heat, vaporize, superheat, condense, cool or solidify, check Bulletin HE-8 describing exchangers designed for temperatures as low as minus 160 F and as high as 1600 F with pressures ranging from vacuum to 9500 psi. — HENRY VOGT MACHINE CO.

**336—Retaining Walls** — Catalog RW 3555 shows how bin-type walls stabilize slopes and gain valuable ground for buildings, parking areas; all metal cellular construction; all-bolted assembly means small crews can do the job. — ARMCO DRAINAGE & METAL PRODUCTS, INC.

**355—Steam-Jet Cleaners** — Bulletins JC-100 and SG-200 describe steam-jet cleaners, Series "R" Speedylectric generates steam to 250 psig and temperatures to 405 F. Larger cleaners available. — PANTEX MFG. CORP.

**357—Mechanical Lubricators** — Various force feed mechanical lubricators, accessories, and components available for lubrication systems described in Bulletin L-60. — MANZEL.

**365—Storage Water Heaters** — Gas-fired, Scalefree 230 units described in Bulletin 4. Fully automatic package requires only simple connections. Available in more than 100 storage and recovery combinations. Storage capacities range from 250-4000 gal. — THE PATERSON-KELLEY CO.

**370—Industrial Fence** — You can eliminate pilferage, control traffic, and improve plant appearance most economically with Anchor Chain Link Fences. Catalog gives case studies from other plants in South-Southwest. — ANCHOR FENCE.

**386—Rigid Frame Buildings** — 8 page bulletin "Dixisteel Rigid Frame Buildings" — low cost, flexibility of design, durability, and minimum maintenance; also triangular or bowstring truss all-steel roof systems; fabricated for rapid erection. — ATLANTIC STEEL COMPANY.

**390—Tank Insulation** — An uninsulated tank is like a giant radiator heating the outdoors — and that costs money. 8-page Ultralite Tank Brochure tells you how you can save over 90% of this heat loss with glass fiber blankets. Can pay for itself in six months to a year. — GUSTIN-BACON.

### PIPING—VALVES—FITTINGS STEAM SPECIALTIES—TRAPS

**402—Forged Steel Valves** — General Purpose Valves, Supplement No. 1 to Catalog F-9, covers gate, globe and angle valves, ½" through 2" sizes, for 150-800 pound service. Featuring 13% chrome stainless steel trim with hard facings. — HENRY VOGT MACHINE CO.

**403—Valve Operators**—Folder shows how re-designed sprocket rim makes any valve readily accessible from the floor. Simplifies pipe layouts, prevents accidents, fits all valve wheels. — **BABBITT STEAM SPECIALTY CO.**

**407—Piping Materials**—Bulletin reports on intensive investigation into problem of main steam piping materials and gives data on stress rupture characteristics of Types 316 and 347 stainless steel piping adjacent to welded joints. — **PITTSBURGH PIPING AND EQUIPMENT COMPANY.**

**409—Lubricated Plug Valves**—Catalog PV-4 covers operational features. Quarter-turn to open or close; lubricant grooves provide positive seal when valve is closed; when open, seating surfaces not exposed. — **THE WM. POWELL COMPANY.**

**410—Flexible Connectors**—How all-metal connectors absorb piping vibration described in Catalog 1D-100C. Convey corrosives, simplify misaligned hookups, and save installation time. Bronze, carbon steel and stainless steel. — **UNIVERSAL METAL HOSE CO.**

**411—Steam Trap Book** — 48 page manual reviews importance of good trapping. Gives complete data on traps and strainers. Contains complete selection, installation, testing and maintenance information. Many useful tables and charts. — **ARMSTRONG MACHINE WORKS.**

**414—Acid Resistant Pipe** — 4 page technical brochure covers properties of Union 20-S stainless steel. Alloy can be welded and put into service without subsequent annealing. Shows comparative resistance to 94 different corrosive agents. — **REYNOLDS ALUMINUM SUPPLY CO. — UNION STEEL CORP.**

**425—Steam Trap** with only three parts — cap, disc and body described in Bulletin 257. No valve closing mechanisms. Only moving part is solid stainless steel disc. Same trap for all loads and pressure 10-600 psi. — **SARCO COMPANY, INC.**

**429—Expansion Joints** — Advantages of the Gun-Pakt expansion joint described in Bulletin EJ-1917. No shutdowns for repacking. Installation suggestions. — **YARNALL-WARING COMPANY.**

**443—PVC Fittings & Flanges** — Corrosion resistant polyvinyl chloride pipe fittings and flanges covered in 12 page catalog, featuring characteristics, advantages, limitations, operating pressures, temperatures and field tests. — **GRINNELL COMPANY, INC.**

**452—Pipe and Tubes**—42 page Bulletin 26 gives types of steel tubes, tensile, creep and rupture properties, welding and forming data, applications and other valuable information. — **National Tube Div., UNITED STATES STEEL CORP.**

**458—Stainless Valves**—Catalog gives complete technical data on stainless steel valves for all purposes. Over 100 valves diagrammed and described. — **REYNOLDS ALUMINUM SUPPLY CO. — COOPER ALLOY CORP.**

**463—Stainless Steel Valves** — Catalog 59 SS describes complete line of gate, globe and swing check valves with full details of valve patterns in alloys that satisfy requirements of most corrosive services. Includes section to show degree of resistance of alloys to many corrosive media under varying conditions. — **JENKINS BROS.**

**488—Power Piping Field Erection** — Increased importance of piping erection proficiency is stressed in new 12-page brochure. Tells how field erection costs and quality are controlled and discusses welding and other technical aspects. — **THE M. W. KELLOGG COMPANY.**

**493—Unions & Swing Check Valves** — Engineering data, sizes, weights and dimensions on Perfect Seal Pipe Unions and Swing Check Valves featured in 20-p Catalog 60. Also features Gasketless Cup-Orifice Unions and Ductile Iron Check Valves. — **CATAWISSA VALVE & FITTINGS CO.**

## KEEP UP-TO-DATE USE SPI READER SERVICE

See pages 75 & 76

### BOILERS—STOKERS TURBINES—BURNERS

**502—Feedwater Treatment** — 4 page catalog tells how Braxton and Flako internally condition water to remove and prevent scale formation and corrosion in boilers. — **ANDERSON CHEMICAL COMPANY.**

**509—Free Coal Counseling** — General information on how Coal Bureau engineers will advise on selection, transportation and utilization of the right coal for your purpose. — **NORFOLK AND WESTERN RAILWAY.**

**510—Vibra-Grate Stoker** — Water-cooled vibrating grate stoker in sizes from 25,000 to 150,000 lb of steam per hour; no dust collector required and assures freedom from smoke, even at low ratings; easily adapted for burning gas or oil in combination with coal, or singly; requires minimum maintenance. — **AMERICAN ENGINEERING CO.**

**515—Packaged Steam Generators** — Bulletin PSG-2 describes factory assembled portable type units from 10,000 lb/hr to 40,000 lb/hr capacities.

Gives construction details and dimensions. In standard pressures of 175,250 and 375 psi gauge. — **HENRY VOGT MACHINE CO.**

**516—Small Boiler Performance** — 4 page bulletin shows how the packaged Ljungstrom air preheater boosts performance. Boilers as small as 25,000 lb/hr can have advantages of regenerative preheating — saves fuel, boosts output, and permits use of lower grade fuels. — **THE AIR PREHEATER CORPORATION.**

**521—Gas Tempering** — How you can burn the most economical fuel available (coal, oil or gas) described in Bul. G-96. Cuts overall plant costs since smaller size unit requires smaller building per kw. — **THE BABCOCK & WILCOX CO.**

**523—Soot Blowers**—Bulletin 1030 describes Vulcan T-30 retractable soot blowers, available in lengths up to 38 ft. Includes sectional drawings and special design features. — **COPES-VULCAN DIVISION.**

**527—Pneumatic Spreader Stoker** — Bulletin shows how unit combines coal drying, metering, conveying, uniform burning and cinder return in one efficient system. — **IRON FIREMAN MFG. CO.**

**532—Economical Steam** — Forced draft, pressurized gas or oil fired units described in SB-59 catalog. Two-drum water tube units include steam trim, draft equipment, burner and combustion safety controls. — **ERIE CITY IRON WORKS.**

**535—Unit Steam Boilers** — Catalog AD-100 — Gives complete information on oil and gas fired "Self Contained" boilers, 15 to 500 hp, 15 to 250 psi for processing and for heating. Gives features, applications, efficiencies, capacities and dimensions. — **CLEAVER-BROOKS CO.**

**536—Automatic Boiler-Burner Unit** — Assembled plant (Scotch-type, two-pass) for all heat or power applications; for low pressure or high pressure use; burner to match for heavy oil, light oil, or combinations of gas/light or gas/heavy oil. Easy maintenance. Bulletin SPI-100 gives details. — **INDUSTRIAL COMBUSTION, INC.**

**539—Industrial Burners** — How to keep heating costs low with Hev-E-Oil commercial-industrial burners described in bulletin SPI-859. Models from 5 to 150 gph; automatic, electronic controls; Hev-E-Duty power gas burners and combination gas/oil burners from 720,000 to 21,000,000 Btu. — **INDUSTRIAL COMBUSTION, INC.**

**549—Firing Systems** — Folder No. 5843 describes industrial packaged forced-draft firing systems for dual-fuel or single-fuel firing of high or low pressure natural, LP or manufactured gas or any grade of oil from No. 2 through No. 6 in Scotch marine, steel firebox, water tube or cast iron boilers. — **IRON FIREMAN MFG. CO.**

(Continued on page 80)

## Bulletins (Cont.)

**551—Packaged Water Tube Boilers** — Complete data and dimensions for boilers ranging from 8000 to 50,000 lb/hr, firing oil or gas or both, described in 12 page Catalog 111-D. — SUPERIOR COMBUSTION INDUSTRIES, INC.

**557—Coal** — Current brochure on "Prescription Coals." — A. T. MASSEY COAL CO., INC.

**563—Burn Refuse Fuels** — Bulletin 510 describes and illustrates spreader stokers for utilizing many refuse and by-product waste materials as fuel to produce steam for process, power or heating. — DETROIT STOKER COMPANY.

**569—Pressure Atomizing Oil Burner** — The new Type C-45 burner for use with economical heavy commercial No. 4 and No. 5 fuel oils described in Bulletin 100. — NATIONAL AIROIL BURNER COMPANY, INC.

**570—Seamless Boiler Tubes** — 44 page Bulletin 12 contains complete description of manufacture, advantages, tolerances, allowable stress and working pressures, bursting strength, weights, steam properties and other data. — NATIONAL TUBE DIV., UNITED STATES STEEL CORP.

**574—Packaged Generator** — Bulletin 582 describes Vapormatic Coil-N-Shell Steam Generator for service requirements of 5 to 150 psig. Gives operation features and specification data. Available with gas, oil, and combination gas/oil fuel systems. — TEXTSTEAM CORP.

**590—Packaged Rotary Burner** — Fully automatic Roto-Pack forced draft units described in Bulletin; 6 sizes, 7 types to fit all automatically fired boilers or furnaces. Burn all grades of fuel oils, gaseous fuels or combination of both — TODD SHIPYARDS CORPORATION.

### ENGINES—DRIVES POWER TRANSMISSION MATERIAL HANDLING

**600—Mechanical Shaft Seals** — Chempro mechanical external seal described in Bulletin CP-551. First seal designed for complete interchangeability with packing. No mounting clamps, machinery stuffing box faces or drilling holes. Install in 30 min. Adjust after installation. — CHEMICAL & POWER PRODUCTS, INC.

**606—Retaining Ring Kits** — 400 Truarc cadmium plated rings — 84 sizes in one economy kit. Sizes from 1/4 to 2 1/2 in. in three most used series of internal, external and universal crescent ring designs — \$34.50 per kit. — DIXIE BEARINGS, INC.

**607—Crane Systems** — Booklet 2008, profusely illustrated, shows how Tramrail transfer cranes can sys-

tematize handling; engineering and application data. — CLEVELAND TRAMRAIL DIV.

**610—Flexible Couplings** — Catalog 60 describes couplings for maintenance-free power transmission — no lubrication, and no wearing parts. Recommended basic coupling arrangements and load classifications are featured. — THOMAS FLEXIBLE COUPLING COMPANY.

**614—Vertical Transportation** — Catalog A-382 describes and illustrates details of passenger and freight elevators and escalators, for use in all types of industrial plants. — OTIS ELEVATOR CO.

**615—Dial Scales** — Catalog gives specifications on dozens of standard and special types for industry. Accessories for printed weight records and remote weight indications. — THE HOWE SCALE CO.

## KEEP UP-TO-DATE USE SPI READER SERVICE

See pages 75 & 76

**628—General Purpose Trucks** — Catalog T-54 describes two wheel hand trucks and platform — a full line manufactured in Rome, Ga. plant to cover your material handling needs. — THE FAIRBANKS CO.

**635—Bearings & Bars** — Pocket size edition 158 gives complete list of cast bronze and sintered bronze bearings and bars. Bearing aluminum bar data included. — THE BUNTING BRASS AND BRONZE COMPANY.

**641—Belt Conveyors** — Cat. ID-591, 88 pages, shows principal belt conveyor products, including heavy duty and standard roller bearing and precision ball bearing idlers. Comprehensive Engineering Data section contains simplified and condensed information for proper selection. — CONTINENTAL CONVEYOR & EQUIPMENT CO.

### WATER TREATMENT—HEATING & AIR CONDITIONING—DUST & FUME CONTROL—REFRIGERATION

**703—Air Conditioning** — Bulletin 122 describes and illustrates operation and suggests applications for air conditioning method that controls humidity to 1% rh and temperature to 1 F (up to 140 F) with accuracy, independent of moisture sensitive instruments. — NIAGARA BLOWER CO.

**705—Test Your Tower** — Bulletin offers simple, proven method by which you can determine how closely your actual tower performance

measures up to specified performance. Particularly applicable to operations geared to temperature of process cooling water. — THE MARLEY COMPANY.

**708—Zeolite Softener** — Bulletin 4530-A, 8 pages, discusses the hydrogen zeolite process—its advantages, chemistry and neutralizing variations. — COCHRANE CORP.

**712—Ion Exchange** — Bulletins discuss Two-Bed De-Ionizers and Mixed-Bed De-Ionizers, with photos to illustrate plant applications and diagrams to show operation. — ILLINOIS WATER TREATMENT COMPANY.

**713—Electric Precipitators** — 26 page Bulletin 104 shows how units meet five engineering requirements — Positive control of gas flow; high, uniform electrode emission; effective continuous cycle rapping; and safe, trouble-free high voltage equipment. Gives 9 time-tested steps to a successful installation. — BUELL ENGINEERING COMPANY, INC.

**715—Amine Treatment** — Return line corrosion is a critical problem in maintaining economical, efficient power plant operation. Bulletin CP-100 shows how amine treatment is an easy, effective and economical way to eliminate pipe corrosion problems. — THE BIRD ARCHER COMPANY.

**716—Dust Collection** — Whether nuisance elimination or process material recovery, check on Whirlx Dust Collector Units. Engineering data available. — THE FLY ASH ARRESTOR CORP.

**719—No Frost Refrigeration** — Bulletin 105 describes with diagrams and photographs method used for food freezing, chilling and warehouse refrigeration on largest scale without frost or ice formation, insuring full capacity and uniform temperature. — NIAGARA BLOWER CO.

**720—Power Roof Ventilator** — 4 page Bulletin 550 illustrates and describes Centritrator, the centrifugal power roof ventilator with the exclusive "jet siphon." Includes capacity and dimension tables. — CLARAGE FAN CO.

**751—Chemical Service** — Water conditioning products, equipment and services highlighted in literature — boiler feedwater treatment, cooling water treatment, corrosion inhibitors, fuel oil additives, coagulants, cation resin cleaners. — Chemical Service Dept., THE PERMUTIT COMPANY.

**756—Refrigeration Problems?** — VMC compressors, intercoolers, chillers, described in Bulletin 817 — design improvements, protective devices and factory-run-in-tests. — THE VILTER MANUFACTURING COMPANY.

**764—Cooling Equipment** — Bulletin 80-D describes company's complete line of commercial and indus-

trial equipment — operating principles, design features. — FRICK CO.

#### ELECTRICAL

**807—Motor Bearings** — Catalog 258 gives complete listing of cast bronze motor bearings for all makes and sizes. — THE BUNTING BRASS AND BRONZE COMPANY.

**809—Capacitor Selection Guide** — 6 page Folder GED-3687 gives tables for choosing proper ratings of switched shunt capacitors for modern induction motors. Covers motors of all standard types, enclosures, and nominal speeds, 220-4000 v, 2-500 hp. — GENERAL ELECTRIC CO.

**813—600-Volt Wiring** — How Anaconda Densheath 900 offers long life, high heat and moisture resistance, chemical stability and easy installation is described in Bulletin DM-5612 — ANACONDA WIRE & CABLE CORP.

**816—High Voltage Protection** — 36 page catalog of linemen's protective equipment describes products for utility and industrial electrical fields. — CHARLESTON RUBBER COMPANY.

**820—Electrical Maintenance** — New contract service (for Southeast only) inspects and tests motors, generators, gearing, control and distribution systems, at a cost less than 1% of value of equipment.—Atlanta Office of WESTINGHOUSE ELECTRIC.

**855—Wiring Analyzer** — 4 page bulletin describes Model 301 Adequate Wiring Analyzer which quickly, simply and easily tests wiring without confusing calculators or slide rules.—SPRAGUE ELECTRIC COMPANY.

**871—Electrical Protection** — Handbook tells how to select protective devices for circuits, motors and apparatus. Condenses all '59 Code references covering protection problems. Explains how installation costs can be cut and space saved with Dual-Element fuses. — BUSSMANN MFG. DIV.

#### Late Bulletins

**X-35—Welding Fittings** — Booklet FB-502A, 8 pages, covers seamless welding fittings and flanges in carbon, alloy and stainless steels, with charts of standard sizes and other illustrations. — BABCOCK & WILCOX CO., Tubular Products Division, Beaver Falls, Pa.

**X-36—Self-Cleaning Filters** — Catalog No. 51-100, 16 pages, presents line of Auto-Klean and Super Auto-Klean filters — all metal, edge type units which do not require cartridge replacement. Cutaway view, selector chart, and flow tables are provided. —THE CUNO ENGINEERING CORPORATION, Adv. Dept., 80 S. Vine St., Meriden, Conn.

**X-37—Heat Exchangers** — Catalog No. 601, 24 pages, shows construction details and engineering data for converters and instantane-



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This steam plant in one of America's larger universities has no scale problem because Ipco Laboratories preventive maintenance program has prevented scale from forming, resulting in more efficient, economical steam production. Get all the facts from your Ipco man.

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**Here's 3-way steam cleaning for only 81¢ an hour (avg.)**

**THE NEW IMPROVED**

**ELECTRIC HYDRO STEAM-JET CLEANER**



**SPEEDYELECTRIC**

- No fumes • No noise
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This heavy-duty unit does *all three*: steam cleans with water, steam and detergent...dry steams...and rinses with hot or cold water. Interchangeable operation—without interruption! Write for descriptive bulletin.

PANTEX builds a complete line of electric steam generators and electric and fuel-fired steam-jet cleaners. Technical bulletins available.

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## Bulletins (Cont.)

ous heaters, both steam to water and water to water heat transfer. Selection charts and statistical tables are included. — **OLD DOMINION IRON & STEEL CORPORATION**, Belle Isle, Richmond 3, Va.

**X-38—Plastic Valves** — Circular, 16 pages, describes corrosion resistant polyvinyl chloride (PVC) plastic valves and fittings as well as related products. Application table and dimensions cover complete line. — **WALWORTH COMPANY**, 750 Third Ave., New York 17, N. Y.

**X-39—Stacker Crane** — Bulletin No. SB-1, 12 pages, illustrates and describes applications of stacker cranes in warehousing of steel bar stock, dies, rolls of cellophane and aluminum foil, drums and pallets. Includes new stacker with telescoping mast, and outlines advantages. — **THE AMERICAN MONORAIL COMPANY**, 1111 East 200th St., Cleveland 17, Ohio.

**X-40—Heat Transfer** — Catalog 160, 32 pages, covers radiators, heat exchangers, supercharger air coolers, industrial and oil field equipment, heating and air conditioning products. Describes the company's facilities and services. — **YOUNG RADIATOR COMPANY**, Racine, Wisc.

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**X-41—Centrifugal Fans** — Catalog 1125, 14 pages, presents the Centrifugal fan, an airfoil centrifugal fan with in-line air flow, having the efficiency of the centrifugal fan, yet requiring less than half the installed space. Illustrated with photographs, construction and installation diagrams, performance curves and tables. — **WESTINGHOUSE ELECTRIC CORPORATION**, Dept. 355, Hyde Park, Boston 36, Mass.

**X-42—Pipe Fitters Manual** — Handbook, 72 pages, concentrates information needed by pipe fitters and pipe welders, including text, tables and illustrations to give mathematical, physical, chemical and metallurgical data at a glance. — **TUBE TURNS DIVISION OF CHEMTRON CORPORATION**, Louisville 1, Ky.

**X-43—Circuit Breakers** — 1961 Guide is designed for easy selection of fusible and circuit breaker devices. Sections cover industrial safety switches (30 to 1200 amp); general duty switches (30-600 amp); service equipment; distribution panels; "E-Z-Red" circuit breaker; enclosures, and wiring troughs. — **WADSWORTH ELECTRIC MFG. CO., INC.**, Dept. G-60, Covington, Ky.

**X-44—Mechanical Power Transmission** — Catalog 23103, 8 pages, describes variable speed drives; v-belt drives; timing belt drives; flat belt pulleys; flexible and rigid couplings; adjustable motor bases; pillow blocks; flange and take-up units; and related equipment. — **T. B. WOOD'S SONS COMPANY**, Chambersburg, Pa.

**X-45—Compressed Air Filters —**

Catalog 6000, 8 pages, announces line of filters for use with pneumatic instruments and controls, spray guns, vacuum pumps and air-operated equipment of all kinds, and for cleaning air used in processing.—KING ENGINEERING CORP., P. O. Box 737, Ann Arbor, Mich.

**X-46—Centrifugal Pumps — Bulletin**

140, 4 pages, introduces new multi-stage, opposed-impeller, centrifugal pumps to handle hot or cold water, hydrocarbons, chemicals, acids, condensate, and similar liquids. Chart illustrates interchangeable components.—PACIFIC PUMPS, INC., 5715 Bickett St., Huntington Park, Calif.

**X-47—Receiver Gauges — Catalog**

520, 8 pages, describes special purpose low pressure receiver gauges used to indicate values transmitted by pneumatic signal from a remote location, usually in the range of 3-15 psi. Gives specifications for both bourdon tube and diaphragm actuated types.—UNITED STATES GAUGE, Div. of American Machine & Metals, Inc., Sellersville, Pa.

**X-48—Alloy Iron — Bulletin No. 158,**

8 pages, charts the engineering properties of Meehanite Metal, Ni-Resist Iron, Ni-Resist Ductile Iron and Ductile Iron. Summarizes mechanical properties, physical characteristics, and chemical composition of centrifugal cast irons.—CENTRIFUGALLY CAST PRODUCTS DIVISION, The Shenango Furnace Co., Dover, Ohio.

**X-49—Temperature Controls — Bul-**

letin MC-190, 8 pages, describes four new temperature controllers featuring transistor circuits and thermistor sensing elements, with wide option of proportioning action, temperature ranges and scales, and remote or local control.—FENWAL INCORPORATED, Pleasant St., Ashland, Mass.

**X-50—Static Control — Bulletin**

GEA-6578A, 8 pages, shows how the static control components simplify panel design and operation, with the G-E logic element as heart of the static control logic system.—GENERAL ELECTRIC COMPANY, Schenectady 5, N. Y.

**X-51 — Electromagnetic Drives —**

Booklet B-7875, 12 pages, tells how electromagnetic drives work, what they include, and where they are used. Discusses various types of drives such as air cooled MagnaFlow drives both integral and fractional, and liquid cooled units.—WESTINGHOUSE ELECTRIC CORPORATION, P. O. Box 2099, Pittsburgh 30, Pa.

**X-52—High Temperature Piping —**

Folder T-467, 6 pages, contains information on 15 steels widely used in high temperature service. Chart gives tensile properties, thermal conductivity and expansion, creep strength, oxidation resistance, and other pertinent data.—BABCOCK & WILCOX CO., Tubular Products Division, Beaver Falls, Pa.

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It's more than a fancy name, to be sure. At least it is in the case of Atlantic Steel.

There's a lot more to this highly specialized business than simply maintaining adequate stocks, and thus eliminating heavy inventory cost for our customers.

It's stocking the *right kinds* as well as quantities of steel and aluminum products for instant shipment. It's providing accurate recommendations on various metals and helping customers find the most economical as well as the most suitable materials. It's the careful attention to every detail of every order.

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## New Product Briefs

(Continued from page 72)

### Portable Sandblaster

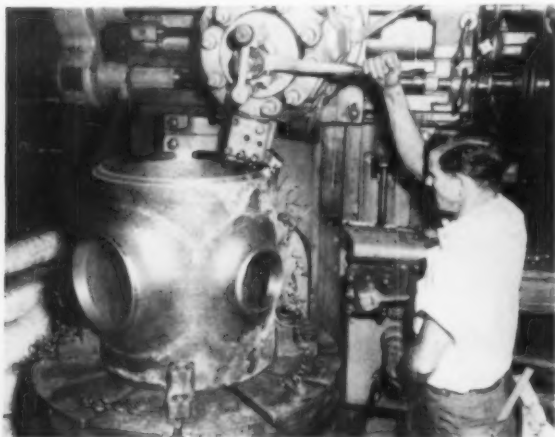
**Y-4** Recently developed and marketed by **Hamill Manufacturing Company, Inc.**, Washington, Mich., is the "Handi-Blast" Portable Sandblaster.

It requires no more air than a production spray gun, and is com-



pletely portable. The over-all height of the unit is 23 inches with a tank diameter of 7 inches. Weight is 23 pounds empty and it has an abrasive capacity of 30 pounds sand. Each sandblaster is tested at 300 psi.

Distinctive features are: built-in sand funnel; automatic opening and closing filler valve; specially designed "Vari-flow" air operating valve; adjustable sand flow valve.



### Dust Filter

**Y-5** A new reverse-air jet dust filter has been designed and produced by the Metal Products Division of **Koppers Company, Inc.**, 200 Scott St., Baltimore, Md. The new filter, Model K Aero-turn, employs cloth felt which is said to be the most effective medium in use for recovering industrial process dust.

As far as improvements are concerned, the new model is greatly simplified from a mechanical standpoint. It features increased standardization and the number of components has been reduced considerably.

A newly-designed blow-ring assembly features "low-rate" adjusting springs providing maximum filter tube cleaning with minimum wear. Through automatic pressure control, the high velocity air-jet cleans excessive dust from the felt when necessary, without requiring shut-down or by-passing. The filter operates, in fact, only when cleaning of the tubes is needed.

### Ultrasonic Cleaner With Solid State Generator

**Y-6** A compact ultrasonic cleaning system has been introduced by the **Branson Ultrasonic Division** of Branson Instruments, Inc., Stamford, Conn., for production cleaning of small parts and sub-assemblies.

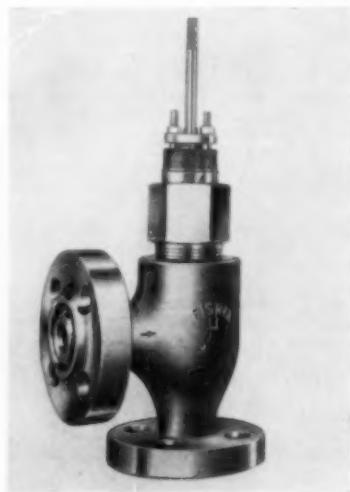
Called Model LG-75, the unit is powered by a 75-watt generator driving a transducerized tank at a nominal frequency of 25 kc. Transistors replace bulky vacuum tubes to achieve a compact generator having long life and requiring little maintenance.

The generator cabinet measures 12 x 10 x 5½ in. high.

A panel-mounted switch turns the generator on, applying 75 watt of high-frequency energy to either of the two transducerized tanks, for conversion into mechanical vibrations of the same frequency.

### Valve

**Y-7** **Fisher Governor Company**, P. O. Box 307, Marshalltown, Iowa, now has available integral flanged end connections on its high pressure 1" and 2" angle



and globe style cast steel valve bodies for oil and gas production, power plant installations and the process industries. These are available with either 1,500 lb or 2,500 lb ASA flanges.

Maximum operating temperature is 450 F. The 2" bodies can also be furnished with 10,000 lb API flanges, rated at 250 F.

### Y-8 Optimum Flow — Minimum Stress

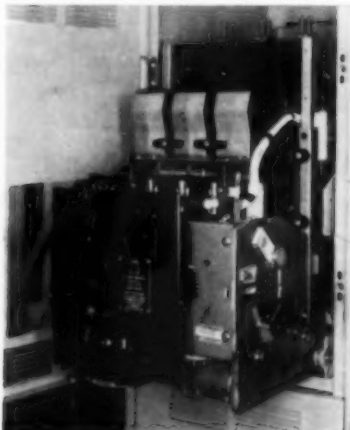
**EXTRUDED** side outlet welding tee manufactured by

Gulfport Piping Company, in Gulfport, Mississippi, for a large Southern gas company. This tee is made from high yield seamless steel pipe 24 inches in diameter with one extrusion being 12 inches in diameter and the other extrusion being 8 inches in diameter. The tee is used as a part of a pipe line compressor bottle handling gas at pressures over 1,000 pounds per square inch. The design of the extruded tee provides the optimum in flow characteristics and reduction of stresses at the welded connections.

For More Free Data **CIRCLE CODE NO.**  
on the Handy Return Card — Page 75

## Current-Limiting Circuit Breakers

**Y-9** **I-T-E Circuit Breaker Company**, 1900 Hamilton St., Philadelphia, announces availability of new, low-voltage current-limiting circuit breakers which provide economical high-speed protection against fault currents up to 200,000 amperes.

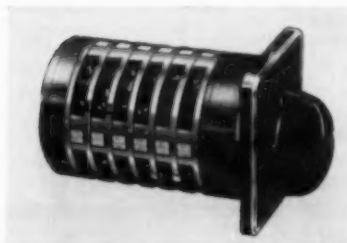


The new, versatile K-Don breakers integrate — in a single switchgear compartment—the fast-acting, high-capacity fault protection of Amp-trap current-limiting fuses with the protective features of its K-Line stored-energy breakers, and a unique device that prevents single phasing.

They provide this additional current-limiting insurance without sacrificing adjusting flexibility of the circuit breaker needed for overcurrent and medium-capacity short-circuit tripping. They provide fault protection up to 200,000 amps.

## Rotary Switch

**Y-10** **American Solenoid Co., Inc.**, U.S. Hwy 22, Union, N. J., announces a modular-designed rotary switch rated at 20 amp, 600 VAC, and carrying four isolated double-break; silver-alloy contacts in each stage. Up to 48 contacts can be employed in a minimum



switch length of twelve stages.

Contacts are operated by a double cam arranged in sandwich fashion within the stage. The cams can be set to operate or to by-pass pre-selected contacts, thus providing a countless variety of contact arrangements. Use of isolated contacts on these switches permits the buyer to order only those contacts needed for his specific circuit.

## New Package for Onox

**Y-11** **Onox, Inc.**, Dept. B-8, 121 Second St., San Francisco 5, Calif., announces that its well-known fungistatic solution, used in plant shower rooms to stop athlete's foot, is now packaged in polyethylene jugs. These new "square" one-gallon plastic containers save space and reduce weight and freight charges by 25 per cent.

Onox has also introduced a new fiberglass and high density polyethylene footsprayer. The familiar sponge rubber footmat is still available.

## Valve — 10,000 psi

**Y-12** A new valve, having a working pressure of 10,000 psi, is announced by **Republic Manufacturing Company**, 15655 Brookpark Rd., Cleveland 35, Ohio.



The valve is made in a variety of models — 2-way, 3-way, and 4-way, with closed and open centers. It withstands 15,000 psi surge, and has a burst pressure of over 30,000 psi. Heavy, one-piece stainless steel body construction is featured, with non-corrosive internal parts. It is available for air, water, and oil services.

Low torque sliding seals and selector disk are stainless steel, honed optically flat for tight sealing. Sizes 1/4" to 1" are offered.

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SINCE USING  
LUBRIPLATE  
LUBRICANTS"**

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of Toledo, Ohio.

"The use of LUBRIPLATE Lubricants has enabled us to operate our trucks with minimum down-time for repairs and parts replacement. Furthermore, we use but one Motor Oil, one grease and one gear lubricant, year round, which greatly simplifies our service program."

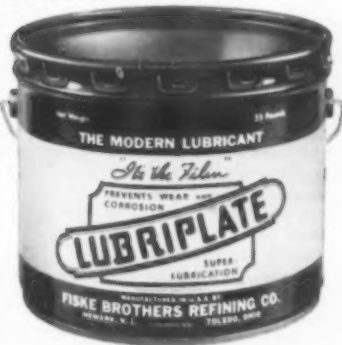
Richard A. Esser, Vice-President,

**REGARDLESS OF THE SIZE AND  
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LUBRIPLATE GREASE AND  
FLUID TYPE LUBRICANTS WILL  
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REDUCE MAINTENANCE COSTS.**

LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.



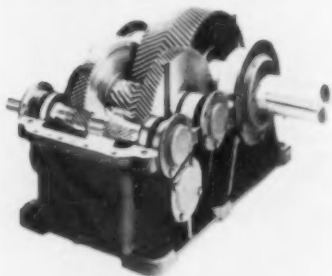
For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



## New Product Briefs (Continued)

### Speed Reducers

**Y-13** Link-Belt Company, Prudential Plaza, Chicago 1, Ill., has introduced a re-designed and expanded line of "balanced design" parallel shaft speed reducers available in 57 sizes.



Drive selections can now be matched more closely to horsepower requirements, with a resultant saving in drive costs. Single, double and triple reduction units are available in capacities up to 2800 hp at high or low output speeds and ratios up to 292:1. Shafts can be arranged to

suit specific drive requirements, and design permits assembly with single shaft projections in either direction or with double shaft projections.

## KEEP UP-TO-DATE USE SPI READER SERVICE

See pages 75 & 76

### Pourable Cement

**Y-14** The Monroe Company, Inc., 10703 Quebec Ave., Cleveland 6, Ohio, is offering "Evr-Tite" pourable cement, a finely divided light gray powder, resulting from a basic cement of an alkaline earth metal. It is processed with expansion controlling and water erosion resisting additives. The proper proportions of these additives result in an extreme surface hardness, plus a high degree of workability and a

fast set (10 to 15 minutes).

The material has no shrinkage while setting. It bonds readily to existing cement floors, and will withstand maximum impact, compression, tensile and shear strengths. It is odorless, vibration resistant and self-leveling.

Its uses include positioning and setting anchor bolts in concrete, fastening pipe flanges, hand rails, partitions, conveyors, fixtures, furnaces, blowers, and other equipment.

### Nickel-Alloy-Bonded Steel Tubing

**Y-15** Because of its corrosion-resisting properties as first detailed by **The Detroit Edison Company** in a report to the American Society of Mechanical Engineers, "Nippos" nickel-alloy-bonded steel tubing is being installed as air heater tubing in an increasing number of steam generating plants, according to the Nickel-Over-Steel Division of **M. L. Sheldon & Co., Inc.**, 350 Lexington Ave., New York City.

In comparing the corrosion resistance of stainless, low alloy and me-

# Loosens

**Handy Won't Leak Shoots 3 Feet**

**FROZEN PARTS FAST!**



Same formula as famous Kroil that has pleased 14,000 industrial users for 10 years or more. Loosens stuck together metal parts, bushings, bearings, bolts, screws, pipe, etc., "anything from an embalmer's needle to a bulldozer," one customer said. "Like an extra employee," said another. "Turned rust into mush, put \$50,000 equipment back to work."

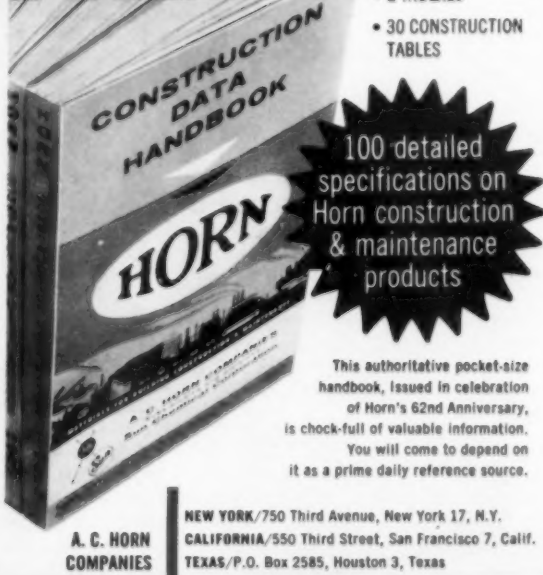
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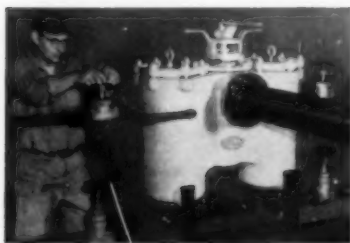
tallic coated steels to combustion gas emanating from a pulverized-fuel-fired steam generator, Detroit Edison concluded that "certain metallic coatings over low alloy steels provide corrosion resistance up to three times as great as that of the low alloy steels themselves."

A chart of data extracted from the ASME report appears in a descriptive brochure just published and offered by M. L. Sheldon & Co. In addition to its superior corrosion resistance, the Niphos nickel alloy is metallurgically bonded and will not peel or flake even when subjected to extreme forming operations. As a consequence, there is no problem about rolling the tubing into tube sheets. Niphos materials can also be welded by regular welding procedures.

### "Backwash" Strainers

Y-16

A new line of "backwash" pipe line strainers has been introduced by the Fluid Control Div. of Zurn Industries, Inc., Erie, Pa.



There are no bolts, covers, or straining elements to remove or replace, and no special tools are needed. A reverse flow of "backwash" fluid rinses the strainer free of foreign matter at the turn of a valve, discharges debris-laden waste directly into existing drainage system.

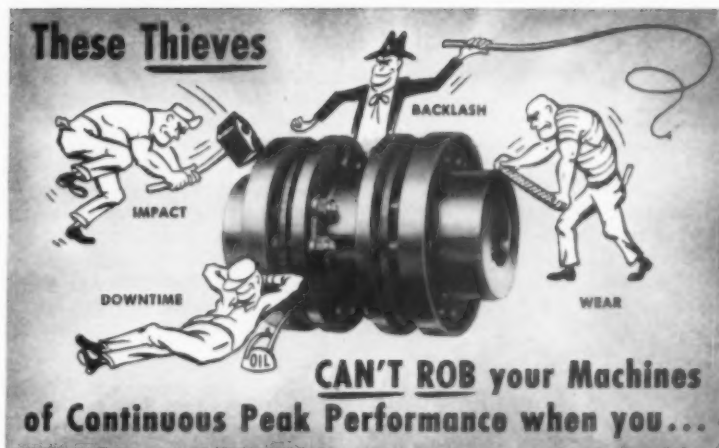
Because the entire straining and "backwashing" process is concealed, maintenance personnel are never exposed to toxic, caustic, or noxious fluids, or high temperature water.

### Plastic Cable

Y-17

The Okonite Company, subsidiary of Kennecott Copper Corporation, Passaic, N. J., has introduced a new small-diameter, low cost, general purpose plastic control cable for all types of installations — conduit, aerial, duct, tray, direct burial, in wet or dry locations.

Okonite P-30 Control Cable is over 30% smaller and lighter than con- (Continued on page 88)



### SPECIFY . . . THOMAS FLEXIBLE COUPLINGS

Think of the losses incurred by maintenance costs, lubrication, down time, damage to connected machines by inadequate flexible couplings.

High degree of accuracy, reliability and performance make Thomas Flexible Couplings the worlds best.

NO MAINTENANCE  
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NO WEARING PARTS  
NO BACKLASH



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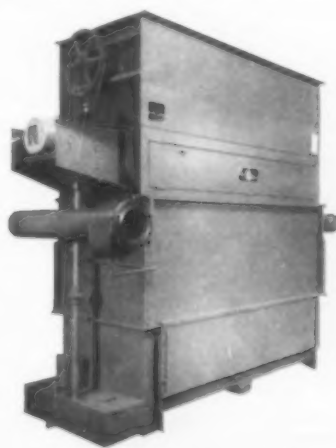
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WARREN, PENNSYLVANIA, U.S.A.

## How to get drier or cooler AIR or GASES at low cost

NIAGARA AERO AFTER COOLER cools a compressed gas, or air, below the temperature of the surrounding atmosphere, thus preventing the condensation of moisture in your lines. The gas will contain only half of the moisture left in it by conventional methods. Even drier gas can be produced if you require it.

In working with controlled atmospheres of inert gases to prevent undesired reactions, this dryness of the gas at low cost is a great advantage. The cost of the Niagara method is low because it uses evaporative cooling, saving 95% of the cost of cooling water (and its piping and pumping). This direct saving of cost pays for the Niagara cooler in less than two years.



If you use compressed air to operate instruments or pneumatic equipment you will get better results by using the Niagara Aero After Cooler.

Write for Bulletin 130, or ask nearest Niagara Engineer if you have a problem involving the industrial use of air.

### NIAGARA BLOWER COMPANY

Dept. SP-12, 405 Lexington Ave., New York 17, N. Y.

Niagara District Engineers in Principal Cities of U. S. and Canada

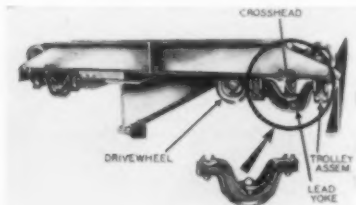
## New Product Briefs (Continued)

ventional rubber cable. Multi-wall construction offers three-fold electrical protection since the basic conductor insulation, its protective covering and the overall jacket are all high quality dielectrics. The double wall of mechanical protection against the chemical attacks of oils, acids, alkalies and other materials plus the tough physical and flame-resistant qualities of the outer jacket make the cable serviceable under rigorous operating conditions.

Reduction in size and weight is in line with today's trend to lighter, more compact control cable designs for use where space is limited.

### Crane End Truck

**Y-18** A new type overhead crane end truck has been introduced by the **Spanmaster Division of Jervis B. Webb Company**, 8951 Alpine Ave., Detroit 4, Mich. It is available for all of the



company's under-running, motor-driven cranes with capacities from one to ten tons.

The eight-wheel end truck consists of a pair of flanged wheels which are mounted on a trolley assembly. A pair of these assemblies are in turn mounted at either end of a load yoke. The frame of the end truck is suspended from this yoke, by means of a cross-head which is supported on

a 2" diameter hard steel ball. Four wheel end trucks use a similar design with the trolley mounted directly on the cross-head.

Use of this ball and socket construction affords complete flexibility in all directions to assure straight line transmission of forces and equal loading on all wheels. Thus, total load is evenly distributed on the runway rail and on the building support members.

## KEEP UP-TO-DATE USE SPI READER SERVICE

See pages 75 & 76

### Bin Vibrator

**Y-19** **Eriez Manufacturing Company**, Erie, Pa., has announced a new magnetic bin vibrator, known as Model 70U. The vibrator is especially designed for moving large quantities of stubborn, hard-to-handle materials through large bins and bunkers, maintaining a steady flow.

The unit features a double impact system in which the hammer strikes an anvil at both top and bottom of the stroke, thus imparting at 60 cycles per second the equivalent of 7,200 sledgehammer blows per minute against the bin wall. Semi-resilient elements have the effect of cushioning the impact sufficiently to result in semi-noiseless operation despite the powerful vibratory action.

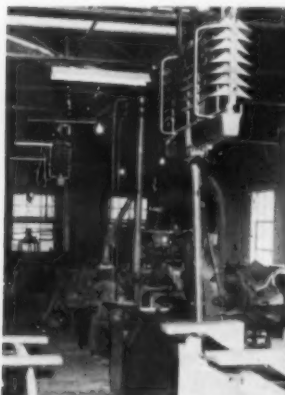


Photo shows the company's smallest 10A Bin Vibrator for use on bin wall thicknesses up to 20 gauge and 2 cu ft capacity, beside the latest addition to the line, the Model 70U, for large bins and bunkers. Both units are completely enclosed and operate direct from an a-c line.

### Automatic Programming

**Y-20** Three new models of automatic programming, recording temperature controls have been announced by the **Parlow Corporation** of New Hartford, N. Y. These include a potentiometer-type proportioning instrument, a two-point control, and an adjustable-differential recorder-controller especially designed for extra long switch life.

Programming is accomplished simply by cutting the pre-determined time-temperature pattern for heating or refrigerating on a plastic cam to be mounted on the face of the instrument. A roller arm rides on the edge of the revolving cam. Actuated by the cam, the roller arm,



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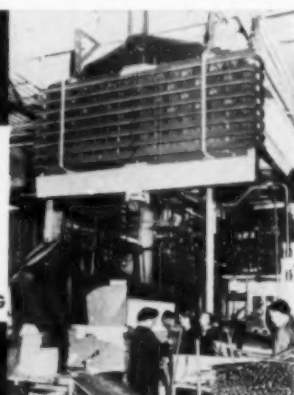
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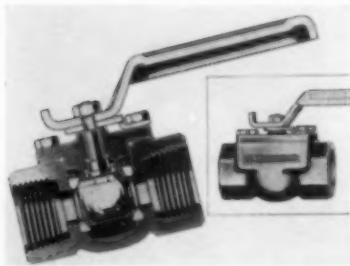


in turn, activates the control mechanism.

The units are available in weather resistant housings, and for virtually every application where automatic programming is desired.

## Ball Valve

**Y-21** A new ball valve line has been introduced by the **Lunkenheimer Co.** of Cincinnati.



The Fig. 700 features bronze body, screw ends, pipe sizes one-quarter to two inches, with Teflon or Buna-N seats and seals. It will also be available in other materials.

Top entry through a removable

cover makes possible easy in-line maintenance.

The ball, which is easily removed by the tool on the valve's specially designed handle, is flat on both top and bottom for access to the seats in case they should need replacement — without breaking the pipe. The self-aligning ball rides on its seats, sealing at high or low pressure without springs or bearings.

## New "Nut Buster"

**Y-22** The **Borroughs Tool and Equipment Corporation**, 2429 N. Burdick St., Kalamazoo, Mich., recently introduced a new "nut buster" for splitting and removing rusty or frozen nuts without damage to threads or bolts, with an added advantage of getting around interferences of various kinds.

The "nut buster" primarily consists of: Federal spec. cast steel hex shaft 3½" long, one end of which is flattened, providing for a round opening that fits over the rusty nut. Running lengthwise through this shaft is a chrome-moly tool steel bolt with a cutter at one end and a



hex head and threads at the other end. Turning the hex head with a wrench drives the cutter into the side of the rusty nut thus splitting it apart and freeing it from the threads. The whole operation is usually a matter of seconds. The cutter is of high quality tool steel and over a hundred nuts may be split before it becomes necessary to resharpen by grinding.

(Continued on page 90)



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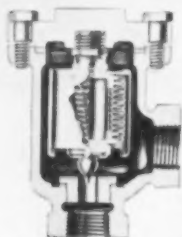


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7. Every trap steam-tested — At maximum rated pressure.

For more information on Sarco Balanced Pressure Thermostatic Steam Traps, contact your Sarco Sales Representative, District Office, or Distributor, or write for Bulletin 250. 2916

\*1" size discharges 9650 lbs/hr. at 10°F. below steam temp., 125 psi.

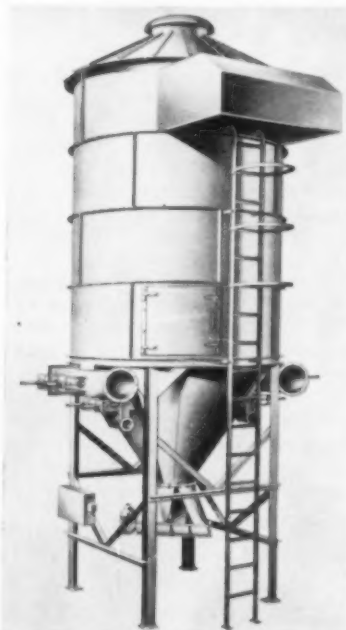
## SARCO

SARCO COMPANY, INC.  
635 MADISON AVENUE, NEW YORK 22, N. Y.  
PLANT: BETHLEHEM, PA.

## New Products (Contd.)

### High Temperature Fabric Collector

**Y-23** A new high temperature glass cloth dust collector has been introduced by American Air Filter Co., Louisville, Kentucky. Answering the need for a fabric arrester where greater than



normal efficiencies are required and high temperatures are a factor, the new collector is available in sizes ranging from 1980 to 17,825 cfm in single units. It also is offered in two arrangements for intermittent or continuous operation.

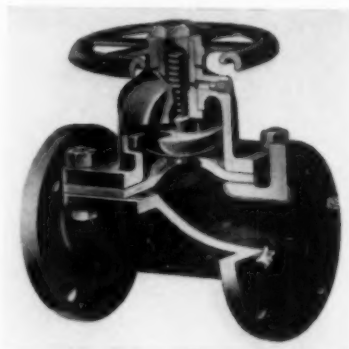
The siliconized custom-made glass fabric bags are designed to withstand constant temperatures of 550 F. This is in lieu of 180-to-200 F maximum temperature limitations of cotton or wool bags used on standard fabric arresters. These bags are the heart of the new system and are available in 11 1/2" diameter and from 14 to 21 feet in length. They are collapsed pneumatically to dislodge collected dust.

### Chlorobutyl Diaphragms

**Y-24** Hills-McCanna Company, 4600 W. Touhy Ave., Chicago 46, Ill., announces that diaphragms molded from a chlorobutyl elastomer base are now available for its 1/2" through 6" diaphragm valves. This new material is said to

provide greater chemical and abrasion resistance at higher temperatures than other elastomeric diaphragm materials.

Chlorobutyl diaphragms may be used at service temperatures of 40 F



to 280 F continuously and for short periods of time in temperature ranges up to 300 F. Allowable pressure ratings are consistent with the valve rating — normally 150 psi. Typical fluids that can be handled include sulphuric acid, nitric acid, hydrochloric acid, chlorine, sodium hydroxide, aqueous chloride salt solutions, organic acids, alcohols, and various oils.

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## PALMETTO. Interwoven Asbestos Packings

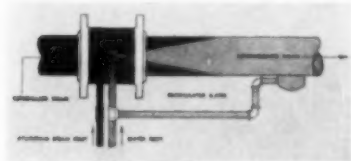


• For the ultimate in durable packing construction choose from the nine interwoven packings in the Palmetto Self-Lubricating Packing line... Combines density of braid over braid—flexibility of plaited. Send for your copy of SLP-659 that gives service conditions, applications, prices, etc.

**GREENE, TWEED & CO.**  
NORTH WALES, PA.

## Desuperheater

**Y-25** An entirely new line of steam ejector, atomizing type desuperheaters has been announced by **Schutte and Koerting Company**, Cornwells Heights, Bucks County, Pa.



The units perform dependably with turn-down ratios as high as 50 to 1, in ranges of 10 to 50 F above saturation temperature, when equipped with adequate pressure and temperature controls. The only other limitation regards the atomizing steam pressure which must be at least 1½ times desuperheater steam pressure and 2% of total flow.

The new desuperheaters also feature straight-through-flow design and are manufactured for installation directly in the superheated steam line with welded, flange or nozzle connections.

## Conveyor Belt

**Y-26** A new woven carcass rubber conveyor belt, called **Industrial Uniflo**, has been announced by **The Goodyear Tire & Rubber Company**, Akron 16, Ohio.

The new belting line is especially adaptable for iron ore and hard-rock mining because of its capacity to be vulcanized into an endless unit in the field.

Conventional woven carcass belts are joined at the ends with mechanical fasteners or hooks that must be operated under reduced tension. However, vulcanized splicing of Uniflo has been made possible by adapting Goodyear's compass uni-plane splice to this new type of uni-plane carcass.

Produced in continuous lengths without cover seams, the belt features nylon reinforced cotton yarn woven into a special interlocking complex.

Thousands of rubber rivets insure maximum adhesion.

For More Free Data FILL IN CODE NO. on the Handy Return Card — Page 75

## CALM Jittery PIPELINES



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Custom-Engineered  
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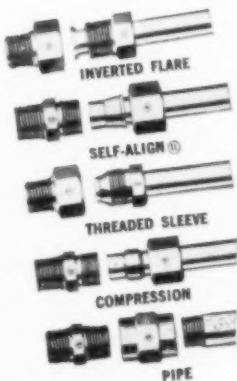
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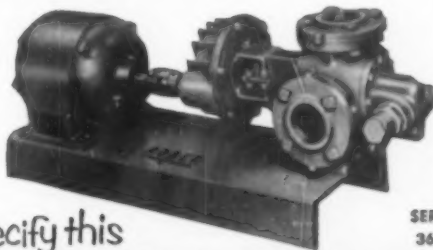
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